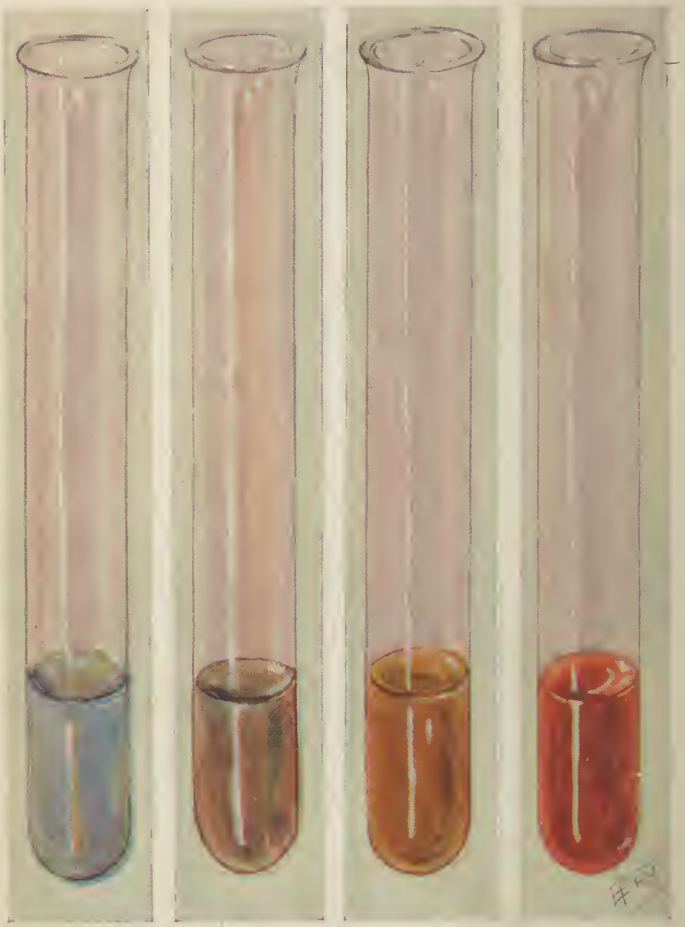
A Primer for Diabetic Patients

WILDER-FOLEY-ELLITHORPE

Second Edition



THE BENEDICT TEST FOR SUGAR IN THE URINE.

Each tube contains 5 c.c. of Benedict's reagent and 8 drops of urine. The tubes have been heated for five minutes in a boiling water-bath and allowed to cool (see page 18).

A Primer
for
Diabetic Patients

A Brief Outline of Diabetic Treatment, Including Directions for the Use of Insulin, Sample Menus, Recipes, and Food Tables

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PREFACE TO THE SECOND EDITION

THE same explanation attaches to the second edition of the Primer as to the first. The book is intended primarily for use with our own patients, replacing mimeographed sheets that were formerly depended on. It is in no sense a treatise on diabetes, and is designed to include only that which the patient himself must know in order to co-operate intelligently with the physician in the management of his disease.

The second edition is much more than a revision. The entire book has been rewritten in order to incorporate directions for the use of insulin and to include certain recent ideas of diet adjustment and of the use of food mixtures richer in fat than was formerly considered permissible. For the theoretic considerations responsible for the latter change the professional reader is referred to recent journal articles. The introduction of insulin is the chief reason for the edition. While this great advance is materially improving the results of treatment, it makes more imperative than ever the intelligent and quantitative control of the diet and necessitates more careful training of the patient than was necessary before. In this edition will be found, furthermore, fifty new recipes which will prove useful in diversifying the restricted régime of the patient.

MAYO CLINIC,
ROCHESTER, MINNESOTA.
August, 1923

PREFACE TO THE FIRST EDITION

THE need for a brief outline of the principles underlying the dietary treatment of diabetes was felt by us in the daily instruction of patients in the matter of their diets and hygiene. Dr. Elliott P. Joslin's "Diabetic Manual" has been a great help, but we desired something more like a primer to place in the hands of the patients. For this reason an outline was prepared and mimeographed; copies of this were used for several months, when the demand for them made it necessary to publish the outline in the present form.

We entirely agree with Dr. Joslin that the education of the patient is essential to successful treatment. It may be true that an occasional nervous person is hurt by such procedure, but those who are benefited vastly outnumber those who have been harmed.

MAYO CLINIC,
ROCHESTER, MINNESOTA.

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A Primer for Diabetic Patients

SECTION I

WHAT DIABETES IS AND WHAT MAY BE EXPECTED FROM TREATMENT

The word diabetes comes from the Greek, and means fountain. The disease was known to the ancient Greeks and received its name because of the large flow of urine which is one of its chief symptoms. This excessive urination is provoked by sugar which comes from the starch and the actual sugars of food, from fats to a limited degree, from albuminous food-stuff like meat, and, to some extent, from wasting body tissues. The process of making sugar from the food-stuffs is a normal one; there is always sugar in the blood in small amounts, about 1 part in 1000, and, in fact, it is as sugar that a large portion of the food enters the tissue cells for consumption. The fault in diabetes is not that the body makes more sugar than usual, but that it cannot use what it has made. Unused sugar thus accumulates in the blood in excessive amounts, and some of this passes into

the urine, through the kidneys. The prominent symptoms of diabetes, therefore, are the presence of sugar in the urine, and the excessive flow of urine which the sugar provokes.

The body disposes of incoming sugar in one of three ways. That which it needs at once for energy or heat, it burns. The balance it stores in the form of a starch-like substance called glycogen, or in the form of fat. The processes of burning and storing sugar, however, require the help of a ferment. Just as yeast must be added to bread to make it rise, or to beer to brew it, so a ferment must be present to work the sugar in the blood. In the body, yeast would be unavailing, and the special ferment is prepared by the pancreas. In the butcher shop the pancreas is called belly sweetbread. Its position in the body is near the stomach. It functions in two ways: (1) making ferments for external secretion through its duct into the digestive tract to assist digestion, and (2) preparing and delivering into the blood an internal secretion. It is this internal secretion of the pancreas with which we are concerned. Actually, one part of the pancreas does the digestive work, and another prepares the internal secretion. Groups of cells in the body of the pancreas are responsible for the sugar ferment. These groups of cells are called the islands of Langerhans.

Diabetes comes whenever these cells are injured sufficiently. Thus, inflammations of the pancreas due

to infection, like the "flu" or scarlet fever, may be followed by diabetes. Stones in the pancreatic duct, tumor of the pancreas, or hardening of the arteries, which carry the blood to the pancreas, may result in diabetes. Other abnormalities may also bear on the cause of this disease; heredity, for instance; diabetes often runs in families. The chief fault, nevertheless, usually lies in the pancreas, and when that organ is injured, it is very slow to heal. Were it completely destroyed, its restoration would be as difficult as the growing of a new arm or leg. This is why diabetes is so hard to *cure*, and why so few people who have once had the disease ever improve enough to be able to eat freely of sugar, starches, and meat without having sugar in the urine.

The purpose in the treatment of diabetes is to provide the diseased or injured islands opportunity for rest. In many diseases rest is the great restorer. The best remedy for heart failure is rest. A man with a weakening heart is confined to his bed and is dosed with digitalis, a drug that slows the rate of the pulse. These measures reduce the load of the heart, and the rest obtained results often in a regain of strength. In the same manner, when the pancreas is weakened by injury or disease, some recovery may be expected if its load can be lightened. So long as its output of sugar ferment is below the amount required to take care of the food sugar, extra unused sugar will sweep with the blood through the tired pancreas and whip

it to the limit of endurance. Now any organ that is thus pushed to overexertion becomes exhausted, and this is true of the pancreas. So if the constant irritation of excess sugar is continued by injudicious eating, the islands weaken more and more, and the diabetes becomes worse and worse. Hence the importance of the diet in the treatment of this disease. By suiting the character and the amount of the food to the condition of the patient, and thus, by limiting the amount of sugar in the blood, improvement can usually be accomplished.

The introduction of insulin permits still more effective treatment. This substance is a watery solution of the sugar ferment from the pancreatic glands of slaughter-house animals. It is a recent discovery of Canadian scientists, Dr. F. G. Banting and Mr. C. H. Best, and was made in the Department of Physiology of the University of Toronto. When insulin is injected into the body, it promotes the utilization of a definite amount of sugar, thus doing part of the work the diseased pancreas of the patient would otherwise be required to do, and thus in a manner supporting the diseased pancreas. Further than this, insulin makes possible larger diets, and enables the patient to regain his former weight and strength. While this does not constitute a cure, yet it represents a great advance in treatment, and, while it is too early to predict what the final results will be, it is permissible, we believe, to expect very considerable actual recovery

of the diseased pancreatic islands gradually to result from the combined help of insulin and careful diet.

The daily dose of insulin and the amount of food for which this dose will provide ferment is a matter that must be determined separately for each patient. The two, food and insulin, must be nicely balanced in order to avoid, on the one hand, an excess of sugar in the blood, and, on the other hand, complications and dangers which result from an overdose of insulin, or from the use of insulin with insufficient food. This requires careful planning by the physician, and intelligent co-operation on the part of the patient. The latter must be taught the fundamentals of dietetics. The success of his treatment will depend on his knowledge of how to test his urine, how to weigh his foods, and how to plan his meals with accuracy. In the milder cases, it is true, patients may be treated successfully without insulin and without weighing food, but the majority of patients, if the best results are to be expected, will have to calculate the food value of their meals and adhere to what may be called the "prescription diet." Such weighing and planning seems formidable at first to many patients, but they soon learn how greatly the reward justifies the effort. The dangerous complications of diabetes may now be in a large measure avoided. The body may be kept strong and vigorous, and the mind clear and healthy. There are many worse afflictions than this.

SECTION II

THE URINE

The continued presence of sugar in the urine means that the disease is incompletely controlled. The simplest way to guard against too much food, or too little insulin, is to test the urine at regular times. As the sugar test is very simple, the patient must learn how to make it himself. The daily examinations of the urine are indispensable as a guide to accurate treatment.

Acetone and diacetic acid are substances which are formed in the body when fat is poorly utilized by the tissues. This abnormal disposal of fat occurs when too little sugar is burning in the vital fires; that is, when a gross disproportion exists between burning fat and burning sugar. Acid poisoning, or acidosis, is seen in healthy men, but in diabetes is more common. It is a serious condition, and if the formation of diacetic acid is permitted to continue uninterruptedly, diabetic coma (see page 44) may result. It is important, therefore, to know how to make the test for diacetic acid, and that test should be applied whenever the urine contains sugar. If the urine is sugar free the test may be omitted, because the serious degrees of acidosis are uncommon when patients are on properly

balanced diets, and when the sugar, which these diets contain, is all being utilized.

It is well for the patient to develop the habit of examining two specimens of urine a day, the last specimen passed before retiring and the first specimen in the morning. He should test each of these for sugar. If none is found, well and good, but if sugar is present, he should test for diacetic acid. A strong diacetic reaction, indicated by the wine-red color discussed below, should put him on his guard, and calls for a readjustment of the diet, or a dose of insulin. (See page 44.)

The Benedict Test for Sugar in the Urine

The Benedict solution used for this test must be prepared with care and should be secured from a reliable druggist. The solution is made as follows (your druggist will be able to follow these directions):

	Gm. or c.c.
Copper sulfate (pure crystallized)	17.3
Sodium or potassium citrate	173.0
Sodium carbonate, crystallized. (If the anhydrous sodium carbonate is used, only one-half this amount should be taken.)	200.0
Distilled water, to make	1000.0

The citrate and carbonate are dissolved together with the aid of heat in about 700 c.c. of water. The

mixture is poured (through a filter if necessary) into a large beaker. The copper sulfate is dissolved separately in about 100 c.c. of water and is poured slowly into the first solution, with constant stirring. The mixture is cooled and diluted to 1 liter. This solution will keep indefinitely.

Direction for the Test.—Place 5 c.c. of the solution, or a trifle over 1 teaspoonful, in a test-tube and add to it from 8 to 10 drops (not more) of the urine to be tested. Heat this over a free flame (alcohol lamp), boil vigorously for three minutes, and allow to cool spontaneously. If sugar is present, a large amount of precipitate will form, filling the solution from top to bottom. The precipitate will be greenish, yellow, or red, depending on the amount of sugar present (Plate 1).

A very convenient way to heat the test-tube is to place it in a teakettle or pan which contains a small amount of boiling water. In this case the heating must be continued for five minutes, during which time the water must boil vigorously. The advantages of this method are that there is less danger of the alkaline solution boiling over and burning the fingers, and less danger of breaking the test-tube.

It is important to clean the test-tube thoroughly after each test. This can be done with a cotton swab, or with a test-tube brush. The precipitate clings to the glass and will not rinse away.

The Gerhardt or Ferric Chlorid Test for Diacetic Acid

To 5 c.c., or a teaspoonful, of freshly voided urine in a test-tube add a 10 per cent. solution of ferric chlorid (chlorid of iron) 1 drop at a time. If diacetic acid is present a wine-red color will be produced. Continue adding the ferric chlorid until, on the addition of each drop, no further deepening of the color is noted. The cloudiness that often forms is due to salts thrown out of solution by the iron, and is of no importance. These solutions usually redissolve when enough ferric chlorid is added. Now pour half the contents of the tube into a fresh tube and heat this portion to boiling for five minutes, comparing its color after heating to the unheated portion. If the original color is from diacetic acid, it will fade on heating, and the heated tube will have a lighter hue than the unheated tube. The test is not complete, therefore, until the effect of heat on the color has been determined. Certain drugs, like aspirin and antipyrin, will cause a bluish-red color to form in the urine on addition of ferric chlorid. And if the patient is being treated with these drugs the urine will have this bluish-red color when the ferric chlorid is added. This color, however, does not fade on heating.

SECTION III

MEASURES AND WEIGHTS: THE METRIC SYSTEM

In the good old days the patient with diabetes was told not to eat starch and sugar, but further restriction was not imposed. For some of the very mild, chronic cases of diabetes such a qualitative restriction of the diet, as we call it, is all that is necessary. But for many years it has been recognized that the severer cases required more accurate control. It is now known that the body makes sugar not only from starches but also from albuminous substances, such as meat, eggs, and cheese, and even to a small extent from the fats, like butter and lard. Hence, restriction of meat, eggs, and cheese, and to some extent of fats may be as important as that of starches. The total amount of sugar made from the food each day should be low enough to avoid the continued excretion of sugar. This means careful planning of the diet and accurate weighing of all food eaten.

A good set of scales must be obtained. Convenient and durable is the counterweighted balance of John Chatillon Sons, New York City (Fig. 1). The dial in this balance is movable and its zero point can be

Fig. 1.—Chatillon gram scales with movable disk. A counterweighted balance convenient for weighing food. An empty glass was placed on the scale pan. The dial was turned by means of the knob, so that its 0 point coincided with the pointer. Milk was then poured into the glass until the pointer stood at 105, the amount of milk desired for a certain diet.

adjusted in such a way that plates, saucers, cups, or glasses may serve for scale pans. The face of the scale reads in grams, that is, in the metric system, which lends itself to this kind of work better than does the English system of ounces and pounds.

The metric system is in general use in the European countries and among scientists in England and America. Its general adoption in America has been urged on our Congress, but thus far without success. The simplicity of this system is that of our dollars and cents. In food planning one may regard a portion of food weighing 100 grams as one dollar, and smaller portions as cents. A small apple or a half of a large orange weighs about 100 grams. Twenty per cent. of such a portion would be 20 grams; 3 per cent., 3 grams, and so forth. Twenty per cent. of a 50-gram portion would be 10 grams, 5 per cent. of a 50-gram portion would be 2.5 grams. Such calculations as these enter into the estimation of the amount of protein, fat, and carbohydrate in the diet, as will be seen. The unit of weight in the metric system is the gram, abbreviated to gm.; 1000 grams is one kilogram (kg.). The unit measure of fluid volume is the cubic centimeter (c.c.). A cubic centimeter of water weighs one gram (1 gm.). One thousand cubic centimeters is called a liter and weighs one kilogram (1 kg.). The approximately equal weights of most food fluids and the fact that one cubic centimeter of any such fluid weighs approximately one gram makes it possible either to weigh fluids on a

balance, or to measure them in a measuring glass. This is a great help.

The metric system measures temperature with a centigrade thermometer. This thermometer is graduated into 100 degrees between the temperature of freezing water, which is called 0, and the temperature of boiling water, which is called 100. Heat is measured in calories, the calorie being the amount of heat necessary to raise the temperature of one liter of water one degree centigrade.

For the convenience of the reader a table of weights and measures is given to show the relations of the metric system to the weights and measures in common use in the United States. The patient is advised, however, to disregard the English system and learn to think in grams and kilograms as soon as possible. This will greatly facilitate his early mastery of his diet.

WEIGHTS AND MEASURES

Approximate Equivalents

1 ounce	= 30 gm.
2.2 pounds	= 1000 gm. or 1 kg.
1 fluidounce	= 30 c.c. and weighs about 30 gm.
1 quart	= 1000 c.c. or 1 liter and weighs about 1000 gm.
1 teaspoon, fluid	= 5 c.c.
1 dessertspoon, fluid	= 10 c.c.
1 tablespoon, fluid	= 15 c.c.
1 large cup or tumbler	= 240 c.c.

To convert ounces to grams, multiply the ounces by 30.

To convert pounds to kilograms, divide the pounds by 2.2.

To convert kilograms to pounds, multiply the kilograms by 2.2.

To convert cubic centimeters to ounces, divide the number of cubic centimeters by 30.

SECTION IV

FOOD: ITS ENERGY VALUE AND COMPOSITION

The body of a man has often been compared to an engine. To heat it and run it, fuel must be supplied to be burned and converted into heat and energy. Experiments have shown that weighed quantities of food develop the same number of measures of heat when burned by man as they would if burned outside of the body, allowance being made for the excretion of unused fractions.

The measure of heat and energy, as has been stated in Section III, is the calorie; the calorie being the amount of heat required to raise the temperature of 1 liter of distilled water 1 degree centigrade. Five lumps of sugar weighing approximately 5 grams each would generate, when burned, about 100 calories, and would raise the temperature of 1000 grams (1 liter) of freezing water to the boiling-point.

Our bodies expend from 1200 to 3000 calories a day, and food must be supplied in an amount sufficient to liberate this quantity of heat. The exact amount of energy expended depends on the amount of physical

work performed and on the size of the body. A man at hard labor may expend over 4000 calories; for a person confined to bed the energy put forth may be 1000 calories or even less. A large man expends more energy than a small man. Children produce heat at a greater rate for their weight than adults. The average food requirement for adults varies between 20 and 40 calories for each kilogram of their weight, while very young children may need as much as 100 calories for each kilogram of their weight.

Work can only be done at the expense of the potential energy in fuel which is liberated when the fuel is burned. The fires of a battleship steaming at 30 knots an hour must be stoked more vigorously than those of the same ship with steam up, but moored to the wharf or anchored in the harbor. In a man's body certain reserves of food substances and even the tissues of the body itself will be burned if the intake of food calories is insufficient to satisfy the demands that exist for energy. In this respect the man's body differs from the steam engine, and for this reason it is not permissible to limit the food allowance of a patient without at the same time limiting physical exertion. Fortunately the introduction of insulin makes it possible to provide diets with a fuel value of from 2000 to 3000 calories a day, and such an energy allowance is sufficient to meet the requirements of all of the occupations except the most strenuous. It is true that some apparently healthy persons eat more than this, but it

is equally true that a great many of these eat more than is good for them.

The fuel constituents of the food are carbohydrate, fat, and protein, and the fuel value of the food depends on the amount of each of these three substances that it contains. In many foods all three of them are found. In others only two, and in still others only one. The fuel value of 1 gram of carbohydrate is 4.1 calories; that of 1 gram of protein, 4.1 calories, and of 1 gram of fat, 9.3 calories.

Carbohydrates.—The starches, such as rice and wheat-flour and sugar, like cane-sugar and honey, are examples of pure or almost pure carbohydrate. In vegetables and fruits the carbohydrate is dilute. In such foods there are large amounts of water, certain non-digestible substances, small amounts of protein and fat, and relatively small amounts of carbohydrate. These foods are very useful in planning the diabetic menus. On the other hand, foods like bread, rice, and sugar are less suitable, because of their richness in carbohydrate. In the process of digestion the carbohydrates are completely changed to sugar.

Fats.—Examples of pure fat foods are butter, lard, and olive oil. Cream is very rich in fat. The meats nearly all contain a certain proportion of fat, nuts and certain fruits, like the olive, are rich in fat. About one-tenth of the fat of the food is changed in the body to sugar.

Protein.—Like fat and carbohydrate, protein burns in the body as a fuel and yields energy for heat and for enabling work. It does not, however, as was formerly believed, yield any more energy than does carbohydrate, and, in fact, it is less efficient as a fuel for work than carbohydrate. It serves, however, an additional purpose, that of building and repairing wasting body tissues. Gelatin, such as is used in making desserts, is a protein. The white albumen of eggs is a mixture of protein and water. The proteins of our tissues are jelly-like structures, similar to egg-albumen, and the peculiar properties of these jellies are responsible for life itself: they are, in fact, the living thing which provides the machinery, so to speak, for the transfer of the energy of the food fuel into muscular movement and other activities. Since machinery of all kinds wears and must be constantly rebuilt and repaired, and as this is true of the body machinery as well, a minimal allowance of protein must be included in the diet to provide for this rebuilding. It is still an open question how large the protein allowance should be. It is estimated that as little as $\frac{1}{2}$ gram each day for every kilogram of a man's body weight will supply the minimum needed, but many authorities insist that more than this should be fed. Children undoubtedly must have more in order to provide for growth, and it is probable that about 1 gram for each kilogram of body weight is desirable even in adults. Large amounts of protein are, however, unnecessary, and may be harm-

ful. In the first place, over one-half of the protein of the food is changed into sugar in the body, so that rich protein has the same effect as rich carbohydrate food. But more important is the stimulating effect which large protein meals have on the vital fires. Meats are "heating," as everyone knows, and this heating process involves an extra strain on the machinery of the body, and may result in a lowering of the tolerance for sugar and aggravation of the diabetes.

The composition of the foods in most common use may be obtained in food tables. Table 2 is a simplified table in which decimals have been omitted. When it has been mastered we would suggest the purchase and study of more complete food tables. Bulletin 28, United States Department of Agriculture, "The Chemical Composition of American Food Materials," may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C.; ten cents in coin to be enclosed with the order.

Besides the fuel substances, the foods contain water, undigestible residues, minerals in the form of salts, and vitamins. The vitamins are called accessory food substances, and while their chemical composition is unknown and they occur only in minute quantities, they are of great importance to the body, and their omission from a diet is often attended with the development of curious diseases, such as rickets and scurvy. Certain foods are richer in vitamins than others, and it is important that diets should contain a sufficient amount

of these rich vitamin foods. Fortunately, butter, fresh green vegetables, and fruits are among such foods, and as these usually play such a large part in the diabetic diet, the diabetic patient is in no great danger of vitamin lack. The same thing is true of the mineral salts.

SECTION V

THE DIET AND ITS USE IN TREATMENT

When the patient is admitted to the hospital his urine is often found loaded with sugar and acid, and coma may be threatening. For this reason it is a general rule to put him in a warm bed at once and give him ample fluid to drink. The diet is then adjusted in such a manner as to rid the body of excess sugar and diacetic acid.

Until very recently the methods of treatment in general use in this country involved undernutrition or prolonged fasting, but today in several diabetic clinics less rigorous methods are employed, and diets are allowed which are more liberal in fat and which, therefore, provide more food calories. The new diets have many advantages, but attending these is an element of danger. Reference was made in a preceding section to the fact that fat will not burn in the tissues unless a certain amount of sugar is burning with it. It has been said that the "fats burn in fire of the carbohydrates." Now if fat fails to burn completely, acid bodies are produced, as has been described, and coma may result. Hence, there is a limit to the amount of fat that may be included in a diet mixture which is low in carbohydrate and, therefore, these high fat diets must be planned exactly to fit the condi-

tion of the patient.* Also, at the beginning of treatment the urine must be examined frequently, and the patient must be watched closely for evidence of acidosis, because a few patients do not tolerate such diets.

After the urine has been made sugar free, the sugar tolerance is determined. The actual procedure here will vary with different patients, and again, the methods of equally good diabetic clinics will differ. The general rule is to increase the diet a little at a time, raising the daily intake of sugar-forming food (usually carbohydrate) until the limit is reached, beyond which any further addition of food causes an excretion of sugar. This is the point of tolerance, and when this is known, a diet can be planned with great precision. It is our practice, at this stage, to prescribe a food mixture which will provide enough protein for tissue building, enough calories from fat and carbohydrate to take care of moderate energy needs, and as little carbohydrate as is consistent with a properly balanced diet, that is, one that will not cause acidosis.

The procedure of determining tolerance and balancing the patient on a satisfactory diet requires a good many days, and during this time the patient is

* For the details of the technic of adjusting these diets the professional reader is referred to the following journal articles:

Adams, S. F.: A consideration of food mixtures for diabetic patients and a method for calculating diets. Med. Clin. N. Amer., July, 1923.

Barborka, C. J.: The use of insulin in the treatment of diabetes. Med. Clin. N. Amer., July, 1923.

learning how to be his own dietitian, how to use a set of scales, how to use food tables, and how to translate his diet prescription, which calls for grams of carbohydrate, protein, and fat, into meals and terms of vegetables, fruit, eggs, and other food-stuffs. This is the part that seems hard at first, and it is for this reason that treatment in the hospital is advisable. It is the most important part of the treatment, and the difficulties are better overcome when patients are in groups like pupils in a school than when they are alone. In the hospital, machinery for such teaching is established just as it would be in a special school. The dietitians help, the doctors help, and the patients help each other. There are lectures, pictures, and models, and even the patients with little education are trained sufficiently to take care of themselves accurately.

Diet order forms (Fig. 2) are prepared each day, in duplicate, by the dietitian, and one copy is sent to the patient with the first meal of the day. These forms show the dietary prescription for the day, the kind of food used, and the amount in grams. They offer a convenient way of planning meals. The names of the foods are written in the food column, then the tables are consulted for advice as to the composition of the foods chosen, and the amounts of each food-stuff are made so that the final total of protein, carbohydrate, and fat agree with the prescription. The trays are carefully checked before they leave the kitchen, but, in addition, the patient is encouraged to recheck each

DIABETIC DIET ORDER--MAYO CLINIC

No. 240 Name John Smith Date 3-20-23

Table No. 3

Diet Rx ..... Carbohydrate 20 Protein 30 Fat 110

FOOD	Breakfast	Dinner	Supper	Total Grams	GRAMS Carbohydrate	Protein	Fat
Vegetables, 5 per cent		150	150	300	9	3	
Bran cakes (Recipe 10)	1	1	1	3	3	6	9
Vegetables, 10 per cent							
Fruit, 10 per cent	50			50	5	0.5	
Vegetables and fruit, 15 per cent							
Vegetables and fruit, 20 per cent							
Hepco cakes							
Eggs			1	1		6	5
Cream, 20 per cent							
Cream, 40 per cent	35	35	30	100	3	2	40
Milk, Skimmed							
Butter or oil	13	14	14	41			34.8
Bacon	20			20		2	13.4
Meat		42		42		10.5	6.3
Fish							
				Total Grams	20	30	109.5

FOOD VALUE OF THE DIET CALORIES

20 Grams Carbohydrate at 4.1 Equals 82

30 Grams Protein at 4.1 Equals 123

109.5 Grams Fat at 9.3 Equals 1018

Total 1223

6-625-W

A. K. D.
Physician

Fig. 2.--The diet order slip. One of these is furnished to each patient daily. It shows the dietary prescription for the day, the type of food and the actual amounts of each food used to fill the prescription, the composition of each of the three meals, and the food value of the diet.

day's diet form, and to compare carefully the trays he receives with the form. In this way a double check is obtained and diet errors are avoided. No food is to be eaten except that which the diet order permits. This rule covers not only the usual foods, but also alcohol in any form, chewing gum,* and chewing tobacco. In the hospital the rule is strictly enforced and any infringement subjects the patient to immediate expulsion.

During the entire hospital stay it is essential to save every drop of urine for the laboratory. Fresh bottles are provided each morning and continuous twenty-four-hour collections are made.

When the patient leaves the hospital he is given a final food prescription. This he continues to follow at home, but he is warned that in the event of his becoming sick with a sore throat, a fever, or other complicating disease the high fat diet must be altered at once. Under such circumstances the sugar tolerance may be temporarily lowered. In consequence all of the sugar in the diet will not burn, and hence the fats will begin to "smoke" (acidosis). In this case the patient must go to bed and omit one-half the fat portion of his diet. If acidosis develops despite these precautions, medical advice must be obtained and, if possible, insulin should be injected (see p. 42).

* Sugar-free diabetic chewing gum (pure chicle) may be obtained from The Weber and Judd Company, Rochester, Minnesota.

SECTION VI

INSULIN AND ITS USE IN TREATMENT

The preceding section was not complicated by a discussion of insulin for two reasons: first, because many patients, especially with a mild type of the disease, may be treated as heretofore, without insulin, and second, because the introduction of this new remedy makes necessary not less, but more, attention to the diet.

Many pancreatic preparations of reputed usefulness in the treatment of diabetes are on the market, but none of them can be recommended except insulin which has been subjected to the scrutiny of rigid laboratory and clinical testing by the foremost medical clinics in the country. Iletin is the trade name of the insulin manufactured by the Eli Lilly Company, who are at present the only approved manufacturers of insulin in the United States. There is every reason to believe that insulin, "iletin," is the active principle of the islands of the pancreas, as the name implies, the sugar-working ferment discussed in Section I.

The dose of insulin will depend on the amount of food that must be taken in order properly to nourish the patient, and on the amount of sugar that the patient can take care of, or tolerate unaided. The

dose of insulin is expressed in terms of units, one unit being enough to "work" about 2 grams of sugar. The daily dose will vary between 10 and 40 units. This is a small volume of fluid, not more than 3 c.c., and it is injected beneath the skin with a syringe and needle. The directions that come with the medicine explain how these injections are made. In the hospital the patient is taught to inject himself, or some member of the family is instructed in the necessary technic.

The course of treatment with insulin begins just as does the dietary procedure described in Section V. Rest in bed is obligatory. The tolerance is determined and a diet is planned which will support the patient without insulin. It is important to do this and to teach the patient that if later, for any reason, his supply of insulin should be interrupted, he should go back to this low diet and take to his bed.

Next a food mixture is planned which will contain from 2000 to 3000 calories and which the patient will be able to tolerate with the help of not more than from 30 to 40 units of insulin. This higher diet and the daily administration of insulin are then started. Certain further adjustment of the diet, or the insulin dosage, may be necessary, but usually everything goes smoothly from this point on. The patient is permitted to be up and about, and he rapidly gains strength and bodily weight.

The time of day when insulin should be given is still a subject of study. At present it seems best in most

cases to inject the entire daily dose at one time, in the morning, preferably just before breakfast. If this is done and the diet is properly balanced, the morning urine should contain a slight amount of sugar, while the evening urine and the urine during the entire day, including the last specimen passed before going to bed at night, should be sugar free. However, patients with a fairly good normal tolerance who are receiving only small doses of insulin, not more than 10 to 15 units as one dose in the morning, may find sugar in the evening specimen and none in the morning specimen. The small amount of sugar in the urine of the morning, or in the milder cases, receiving smaller doses, a small amount of sugar in the evening urine, but none in the morning, is thought to be desirable, because under such conditions the blood-sugar level is usually high enough, at the time the injection is made, to cushion the shock of the injection of the large single dose of insulin. The patient, after leaving the hospital, discontinues the collecting of twenty-four-hour specimens of urine and examines merely the last specimen before going to bed and the first specimen in the morning after rising. With Combination A (Table 3), therefore, or Combination B, no changes are required, either in the diet or in the insulin dose. If, however, sugar is found *both night and morning*, Combination C, either the diet is too rich and must be reduced, or the dose of insulin must be raised. It seems simpler not to change the insulin, but to make the

necessary changes in the diet. Table 1 shows that when both night and morning urines contain sugar, 20 grams of white bread which are customarily included in the breakfast meal are to be removed. If sugar persists, the dose of insulin must be raised. If both night and morning urines are free from sugar, Combination D, the dose of insulin may be a little high for the amount of food, and the food should be raised by adding 20 grams of white bread to the morning meal. If the condition continues for several days, and especially if moderate reactions are noticed, another addition of 20 grams of white bread should be made. Thus, by juggling the white bread allowance of the breakfast meal, we accomplish, in most cases, a condition in which the urine is free from sugar for eighteen or more hours of the twenty-four, and which is safe from severe reactions.

TABLE 1

	Night urine.	Morning urine.	Breakfast.
Combination A...	No sugar	Sugar	No change
Combination B...	Sugar	No sugar	No change
Combination C...	Sugar	Sugar	Take away 20 gm. of white bread
Combination D...	No sugar	No sugar	Add 20 gm. of white bread

Patients receiving more than 30 units of insulin a day are given 25 units with breakfast and the balance

at 3.00 P. M. Table 1 serves as a guide in this case also. For many reasons the single injection is preferred to the multiple injection; but apparently it is difficult for the patient to tolerate a dose much larger than 30 units at one time, or to derive the maximum of benefit from such a dose. Various arrangements of meals and insulin may be just as effective as those suggested. They involve, however, more frequent examinations of the urine. We are attempting here to formulate only the simplest procedure that seems safe.

Remember, if for any reason insulin is to be discontinued, it is imperative to discontinue the high caloric diet and to return to the low calorie or original subtolerance diet. At the same time activities must be curtailed. It is imperative to go to bed. The low diet and rest must be continued until insulin can be resumed.

The Insulin Reaction.—Insulin, like the automobile and many other good things, is dangerous unless it is used properly. It must always be balanced with food. If it is given with an inadequate diet, or if more of it is given than can be balanced by the sugar of the diet, or that derived from the tissues, it will cause the sugar in the blood to disappear, and when the blood-sugar has fallen below a certain level, symptoms occur that may be very alarming. The first sensation is that of hunger, although this may be missing; then occur drowsiness, muscular weakness, and a feeling of anxiety, like the fear of the dark, with which all children and many adults are familiar. The

muscles tremble and the hair seems to stand on end. The trembling may be visible or merely a sensation. Sweat breaks out on the forehead and over the body, the breathing becomes fast, and the pulses bound. Recovery from this condition may be spontaneous, but if a big dose of insulin has been taken, and, if there is not enough food sugar to cushion its action, and if nothing is done to stop the reaction, the patient may lose consciousness and die. This should impress on everyone the necessity of using insulin wisely and accurately, and of the importance of training the patient in this important matter. Fortunately, there is a very effective and simple antidote for the insulin reaction. This is sugar—sugar by mouth as candy, molasses, or honey, or sugar by rectum in the form of an enema. If the condition is detected soon enough and before the patient loses consciousness, sugar by mouth is all that is necessary, and brings relief almost immediately. The juice of a small orange is usually sufficient, and it is not advisable to take more sugar than this unless it should become necessary later. If, however, the patient is unconscious and unable to swallow, 4 tablespoonfuls of sugar should be dissolved in lukewarm water and run slowly into the rectum, or 1 c.c. of epinephrin (for a child 0.5 c.c.) should be injected under the skin in the same way that insulin is injected. Epinephrin usually resuscitates the patient enough to permit him to swallow; he can then be given orange juice by mouth, and thus be completely resuscitated.

It is important to follow the epinephrin by sugar. Fortunately, severe reactions from insulin need never occur if the diet and the insulin are properly balanced; and while mild reactions are not uncommon, they are promptly controlled by a little orange juice. Should mild reactions occur for two or three days in succession, the breakfast should be increased by a small addition of white bread, 10 to 20 gm. One great advantage of giving all the insulin at breakfast time is that the reaction, if it comes at all, will come in the forenoon, that is, at a time when the patient is awake, and when the antidote, sugar or orange juice, can be given without delay. With the dose divided in two or three parts, given separately at different times, the greatest effect comes later in the day, and the reaction may find the patient in sleep and thus fail to attract attention until it is too late for help. It is certainly unwise to give insulin in the evening, or at night, except in emergencies when constant watch is kept.

The Treatment of Fevers and Infections in Diabetes

A fever of any kind, or infection like sore throat, pneumonia, carbuncle, or boil, may lower the tolerance of the diabetic patient and keep it low until he has recovered from the complicating disease, whatever it is. This may be serious because, as a result of the lowered tolerance, the fat may be incompletely

burned, acidosis develop, and coma threaten. Usually in such cases the appetite is lost, which is in a way a safeguarding device of nature. Yet despite the fact that the patient may eat very little, sugar may persist in the urine and acidosis become extreme. With these complications a physician will, of course, be called without delay, and his advice must be followed. Our practice, in such emergencies, is to limit the diet, at the same time rearranging the food in such a way that it consists largely of liquids, milk, cream, fruit juice, custards, and eggnogs. We also start giving insulin in divided doses over the day, deciding on the dose by close observation of each specimen of urine passed, and trying always to keep the urine free from acid, but not completely free from sugar. We leave this trace of sugar in the urine to serve as a guide of the dose of insulin and as a shock absorber to protect against overdosage, and we consider that it is very important to have this shock absorbed in these emergencies, especially in children. The amount of insulin required in such cases may be large, from 5 to 10 or 20 units, given four, five, or six times a day.

It should be emphasized that the amount of insulin required daily during the period of a complicating disease, such as a fever, will be greater than the dose necessary at other times. This will be true usually, even if the food intake is diminished by the fitfulness of the fevered patient's appetite. It is well, therefore, to keep a reserve of from 500 to 1000 units of insulin on

hand to meet such emergencies. When the fever has abated, and the emergency passed, the previous dosage and diet should be resumed.

The Treatment of Diabetic Coma

The conditions of severe acidosis and coma are of such grave significance that the patient must understand them and know how to treat them. A stitch in time here saves ninety; hence the importance of watching the urine for diacetic acid whenever it contains sugar. The gravest danger of acidosis comes during fevers and complicating diseases, such as have been discussed, but the same trouble may be caused by disregard of the diet and indiscriminate eating, or by exhausting physical exertion, or by continuing the high diet that is permitted with insulin at a time when no insulin can be obtained. The symptoms which announce the onset of coma are drowsiness, nausea, pain in the stomach, roaring ears, and the breath smelling strongly of the fruity, sweet odor of acetone. Breathing becomes slow, labored, and deep. In case no insulin is available the following rules cover the treatment of this condition:

1. Put the patient to bed and keep him warm with blankets and hot-water bottles. A trained nurse should be had if possible. The patient must be watched constantly to prevent his leaving his bed and moving about.

2. Adminster a cleansing enema of 1 quart of warm soapsuds.

3. Give liquids in abundance; for adults 1 quart every six hours, for children not less than 1 pint every six hours. Liquids may be given, as water, fat-free bouillon, or clear coffee. Especially useful is a cup of strong black coffee every three hours. If the patient is vomiting, the liquid must be given by enemas. For these, warm salt solution is used, 1 teaspoonful of table salt to a quart of water, run into the rectum.

4. Give the juice of one small orange (strained) every three hours. If orange juice is not tolerated, try strained oatmeal gruel, $\frac{1}{2}$ cupful every three hours.

5. Call your physician; he may apply other measures. It is our practice to wash out the stomach with a warm 5 per cent. solution of sodium bicarbonate. Heart stimulants are desirable. We give 1 c.c. of "digifolin" subcutaneously every hour for at least six doses. Sodium bicarbonate may be used in teaspoonful (5 gm.) doses by mouth every half-hour with 200 c.c. of water, and a 5 per cent. solution of sodium bicarbonate may be given by rectum. The administration of soda is continued until from 40 to 60 gm. have been given. If possible this amount should be administered within six hours. After that, smaller doses are sufficient—5 gm. every two hours. The use of soda in the treatment of diabetic coma is advised against by some eminent specialists in this field. Our experience, however, leads us to believe that the objec-

tions to its use are insufficient, and that it may be of great value in certain cases.

If insulin is available the chances of success in the treatment of this emergency are greatly increased. The measures described should be followed and insulin used as an adjunct. The dose cannot as yet be made a matter of rule-of-thumb. Our practice has been to give 30 units at once, with 150 gm. of orange juice by mouth, and 150 gm. of orange juice three hours later, repeating this régime every six hours until the urine becomes free from diacetic acid. Every specimen of urine must be examined and the size of the dose of insulin governed accordingly.

SECTION VII

SPECIAL NOTES AND DIRECTIONS

The Teeth.—Decayed teeth, dead teeth, and pyorrhea are a source of danger. Especially good care should, therefore, be taken of the teeth. Brush them after each meal and visit a dentist for a careful examination, cleaning, and filling cavities once every six months.

Abscessed teeth should be extracted. This should be done with a local anesthetic. Don't fail to warn the dentist of your diabetes. Danger attends all operations on diabetic patients. General anesthetics, especially ether and chloroform, should be avoided.

The Skin.—Infections of the skin, boils, carbuncles, acne, and eczema are common complications of untreated diabetes. Avoid cuts and abrasions. A solution of tincture of iodin should be on hand and any cuts should be painted with it at once; if at all serious they should be reported to a physician.

Older patients are likely to suffer particularly from abrasions or infections of the feet. A poor circulation of blood, the result of hardening of the arteries, accounts for this. The feet must be washed at least once a day and dusted with talcum after washing and drying. A little cotton should be kept between the toes

if there is much moisture. Corns should not be pared, but removed by collodion and salicylic acid. The toe-nails should be filed off square across. It is well to avoid scissors and knives.

Hygiene.—Regular and adequate sleep, regular meal hours, regular habits, well-ventilated sleeping rooms, breathing exercises, and outdoor exercise will help in diabetes as much as in any other condition. Exercise should not be carried to the point of fatigue, but must be moderate. Swedish exercises are particularly useful in building up undernourished patients.

Cathartics for Diabetics.—The patient must remember that many cathartic medicines contain sugar. We have found the following sugar-free preparations suitable for the control of constipation: Plain Granular Agar-agar, Parke, Davis & Company, and Diabetic Petrol Agar, Deshell Laboratories, Los Angeles. Besides these, the various mineral oil preparations and bitter fluidextract of cascara may be used.

SECTION VIII

DIET MENUS AND RECIPES

If patients are to be treated with insulin it is absolutely obligatory that they should be trained to use food tables, to calculate their diets accurately, and to weigh their foods. They must be able to adhere strictly to the dietary prescription, else they cannot avoid the danger of reaction from overdosage with insulin. The menus that are suggested herewith are intended merely as working models or examples. For patients with a mild form of the disease, not receiving insulin, and for patients insufficiently trained to follow prescription diets, and hence, not on insulin, they are sometimes useful.

The recipes which follow the menus are designed to add variety to the patient's diet. The meals served in the hospital are intentionally simple, first, for the sake of accuracy, and second, because patients learn food values more easily from observing the simple foods. After they are trained they are encouraged to diversify their diets with these recipes in order to avoid monotony.

SAMPLE MENUS

Group 1*: 20 gm. carbohydrate, 30 gm. protein, 110 gm. fat.

DIET NUMBER 1.

Breakfast:

Orange	50 gm.
Bacon	20 "
Bran Cake (Recipe 10)	1
Butter	13 "
Cream, 40 per cent	35 "

Dinner:

Meat, weighed cooked	42 gm.
Stewed tomatoes	150 "
Bran Cake (Recipe 10)	1
Butter	14 "
Cream, 40 per cent	35 "

Supper:

Egg	1
Spinach, weighed cooked	100 gm.
Head lettuce	50 "
Bran Cake (Recipe 10)	1
Butter	14 "
Cream, 40 per cent	30 "

DIET NUMBER 2.

Breakfast:

Peach, fresh	34 gm.
Egg	1
Bran Cake (Recipe 10)	1
Butter	15 "
Cream, 40 per cent	35 "

* Patients receiving Group 1 diets should be confined to bed.

Dinner:

Meat, weighed cooked	22 gm.
Asparagus, weighed cooked	100 "
Carrots, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	16 "
Cream, 40 per cent	35 "

Supper:

Egg	1
String beans, weighed cooked	75 gm.
Celery	25 "
Bran Cake (Recipe 10)	1
Butter	15 "
Cream, 40 per cent	30 "
Walnuts	10 "

DIET NUMBER 3.

Breakfast:

Pineapple, fresh	30 gm.
Egg yolk	1
Bacon	10 "
Bran Cake (Recipe 10)	1
Butter	18 "
Cream, 20 per cent	35 "

Dinner:

Meat, weighed cooked	52 gm.
Spinach, weighed cooked	50 "
Beets, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	20 "
Cream, 20 per cent	35 "

Supper:

Egg yolk	1
Bacon	10 gm.
Cauliflower, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	18 "
Cream, 20 per cent	30 "
Strawberries, fresh	30 "

DIET NUMBER 4.

Breakfast:

Orange	50 gm.
Egg	1
Olmsted Bran Cake (Recipe 9)	1
Butter	10 "
Cream, 40 per cent	35 "

Dinner:

Meat, weighed cooked	36 gm.
Cabbage, weighed cooked	100 "
Olmsted Bran Cake (Recipe 9)	1
Butter	11 "
Cream, 40 per cent	35 "
Strawberries, fresh	30 "

Supper:

Noodle Soup (Recipe 12).	
String beans, weighed cooked	100 gm.
Olmsted Bran Cake (Recipe 9)	1
Butter	10 "
Cream, 40 per cent	30 "
Pineapple, fresh	30 "

DIET NUMBER 5.

Breakfast:

Grapefruit	37 gm.
Bacon	20 "
Bran Cake (Recipe 10)	1
Butter	8 "
Cream, 40 per cent	35 "

Dinner:

Beef steak, lean, weighed cooked	40 gm.
Tomato Sauce (Recipe 72).	
Onions, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	8 "
Cream, 40 per cent	35 "

Supper:

Egg	1
Asparagus, weighed cooked	50 gm.
Lettuce and cucumbers	50 "
Bran Cake (Recipe 10)	1
Cream, 40 per cent	30 "
Butter	8 "
Pecans	10 "

DIET NUMBER 6 (Liquid).

Breakfast:

Egg	1
Cream, 40 per cent	70 gm.
Milk	95 "

Dinner:

Egg	1
Cream, 40 per cent	70 gm.
Milk	90 "

Supper:

Egg	1
Cream, 40 per cent	60 gm.
Milk	95 "

Group II: 40 gm. carbohydrate, 40 gm. protein, 160 gm. fat.

Diet Number 1.

Breakfast:

Orange	94 gm.
Egg	1
Soya Manna Muffin (Recipe 8)	½
Butter	16 "
Cream, 40 per cent	70 "

Dinner:

Meat, weighed cooked	30 gm.
String beans, weighed cooked	100 "
Onions, weighed cooked	100 "
Soya Manna Muffin (Recipe 8)	½
Butter	17 "
Milk, skimmed	100 "
Cream, 40 per cent	70 "

Supper:

Egg yolks	2
Spinach, weighed cooked	100 gm.
Beets, weighed cooked	100 "
Soya Manna Muffin (Recipe 8)	½
Butter	17 "
Cream, 40 per cent	60 "
Walnuts	10 "

DIET NUMBER 2.

Breakfast:

Grapefruit	80 gm.
Egg	1
Bacon	20 "
Bran Cake (Recipe 10)	1
Butter	16 "
Cream, 40 per cent	50 "

Dinner:

Meat, weighed cooked	58 gm.
Asparagus, weighed cooked	100 "
Potato, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	17 "
Cream, 40 per cent	50 "

Supper:

Oysters, weighed uncooked	50 gm.
Cream, 40 per cent	100 "
Tomatoes, weighed cooked	100 "
Bran Cake (Recipe 10)	1
Butter	17 "
Strawberries, fresh	50 "

DIET NUMBER 3.

Breakfast:

Peach, fresh	30 gm.
Oatmeal, weighed uncooked	15 "
Egg	1
Bacon	20 "
Bran Cake (Recipe 10)	1
Butter	20 "
Cream, 40 per cent	75 "

Dinner:

Meat, weighed cooked	42 gm.
Squash, weighed cooked	100 "
Head lettuce	50 "
Bran Cake (Recipe 10)	1
Butter	23 "
Cream, 40 per cent	40 "

Supper:

Cheese (Pale American)	25 gm.
String beans, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	22 "
Apple	70 "
Cream, 40 per cent	35 "

Diet Number 4.

Breakfast:

Banana	50 gm.
Egg	1
Bacon	20 "
Olmsted Bran Cake (Recipe 9)	1
Butter	8 "
Cream, 40 per cent	60 "

Dinner:

Fish, weighed cooked	58 gm.
Tomatoes, weighed cooked	100 "
Carrots, weighed cooked	100 "
Olmsted Bran Cake (Recipe 9)	1
Butter	9 "
Cream, 40 per cent	70 "
D-Zerta Diabetic Jello	½ pkg.
Strawberries	30 gm.

Supper:

Egg	1
Bacon	20 gm.
Spinach, weighed cooked	100 "
Olmstead Bran Cake (Recipe 9)	1
Butter	8 "
Cream, 40 per cent	70 "
Orange	90 "

DIET NUMBER 5.

Breakfast:

Apple	80 gm.
Egg	1
Bacon	26 "
Bran Cake (Recipe 10)	1
Butter	15 "
Cream, 40 per cent	50 "

Dinner:

Beef Stew (Recipe 17).

Tomatoes, weighed uncooked	50 gm.
Parsnips, weighed cooked	50 "
Bran Cake (Recipe 10)	1
Butter	20 "
Cream, 40 per cent	50 "

Supper:

Egg yolks	2
Spinach	100 gm.
Lettuce and Cucumber Salad	50 "
Bran Cake (Recipe 10)	1
Butter	17 "
Cream, 40 per cent	50 "
Almonds	10 "

DIET NUMBER 6.

Breakfast:

Orange	120 gm.
Egg	1
Bacon	10 "
Bran Cake (Recipe 10)	1
Soya Manna Cake (Recipe 8)	½
Butter	26 "
Cream, 20 per cent	35 "

Dinner:

Egg yolk	1
Bacon	20 gm.
Cabbage, weighed cooked	100 "
Potato, weighed cooked	50 "
Soya Manna Muffin (Recipe 8)	1
Butter	27 "
Cream, 20 per cent	35 "

Supper:

Egg yolks	2
Bacon	15 gm.
Tomatoes, weighed cooked	100 "
Soya Manna Muffin (Recipe 8)	½
Bran Cake (Recipe 10)	1
Butter	27 "
Cream, 20 per cent	30 "
Peach, fresh	50 "

Group III: 60 gm. carbohydrate, 50 gm. protein, 210 gm. fat.

DIET NUMBER 1.

Breakfast:

Orange	93 gm.
Egg	1
Bacon	20 "
Bread, white	20 "
Butter	23 "
Cream, 40 per cent	80 "

Dinner:

Meat, weighed cooked	42 gm.
Potato, weighed cooked	50 "
Spinach, weighed cooked	100 "
Soya Manna Muffin (Recipe 8)	1
Butter	24 "
Cream, 40 per cent	85 "

Supper:

Egg	1
String beans, weighed cooked	50 gm.
Lettuce, tomato, and cabbage salad	50 "
Soya Manna Muffin (Recipe 8)	1
Butter	23 "
Cream, 40 per cent	85 "
Walnuts	10 "
Cherries, weighed cooked	100 "

DIET NUMBER 2.

Breakfast:

Apple	100 gm.
Egg	1 "
Bacon	30 "
Bran Cake (Recipe 10)	1
Butter	24 "
Cream, 40 per cent	70 "

Dinner:

Meat, weighed cooked	43 gm.
Potato	50 "
Asparagus, weighed cooked	100 "
Onions, weighed cooked	100 "
Bran Cake (Recipe 10)	1
Soya Manna Muffin (Recipe 8)	½
Butter	25 "
Cream, 40 per cent	70 "
Orange	40 "

Supper:

Egg	1
Bacon	20 gm.
Tomatoes, weighed cooked	100 "
Bran Cake (Recipe 10)	1
Soya Manna Muffin (Recipe 8)	½
Butter	25 "
Cream, 40 per cent	60 "
Strawberries	100 "

DIET NUMBER 3.

Breakfast:

Pear, fresh	100 gm.
Egg	1
Bacon	30 "
Olmsted Bran Cake (Recipe 9)	1
Butter	10 "
Cream, 40 per cent	85 "

Dinner:

Meat, weighed cooked	80 gm.
Potato, weighed cooked	50 "
Turnips, weighed cooked	100 "
Beet greens, weighed cooked	100 "
Olmsted Bran Cake (Recipe 9)	1
Butter	18 "
Cream, 40 per cent	85 "

Supper:	Egg yolk	2
	Cauliflower, weighed cooked	100 gm.
	Lettuce, tomato, celery salad	100 "
	Olmsted Bran Cake (Recipe 9)	1
	Butter	10 "
	Cream, 40 per cent	80 "
	Ripe olives	50 "
	Orange	100 "

DIET NUMBER 4. *Breakfast:*

	Grapefruit	100 gm.
	Oatmeal, weighed dry	15 "
	Egg	1
	Bacon	30 "
	Bran Cake (Recipe 10)	1
	Butter	20 "
	Cream, 40 per cent	70 "
Dinner:	Fish, weighed cooked	50 gm.
	Carrots, weighed cooked	100 "
	String beans, weighed cooked	100 "
	Bran Cake (Recipe 10)	1
	Butter	25 "
	Cream, 40 per cent	70 "
	Strawberries, orange, and pineapple, sliced	64 "
	Walnuts	10 "
Supper:	Egg	1
	Bacon	30 gm.
	Beets, weighed cooked	100 "
	Spinach, weighed cooked	75 "
	Radishes, weighed uncooked	25 "
	Bran Cake (Recipe 10)	1
	Butter	20 "
	Cream, 40 per cent	60 "
	Milk	100 "

DIET NUMBER 5.

Breakfast:

Banana	75 gm.
Egg	1
Bacon	20 "
Bran Cake (Recipe 10)	2
Butter	15 "
Cream, 40 per cent	70 "

Dinner:

Egg	1
Bacon	20 gm.
Squash, weighed cooked	100 "
Cabbage, weighed cooked	100 "
Bran Cakes (Recipe 10)	2
Butter	16 "
Cream, 40 per cent	70 "
Apple, weighed uncooked	50 "

Supper:

Egg	1
Bacon	20 gm.
Carrots, weighed cooked	100 "
Tomatoes	100 "
Bran Cakes (Recipe 10)	2
Butter	15 "
Cream, 40 per cent	60 "

Fruit Jello (Recipe 83).

DIET NUMBER 6.

Breakfast:

Apple	100 gm.
Egg yolk	1
Bacon	30 "
Bran Cake (Recipe 10)	1
Butter	23 "
Cream, 40 per cent	50 "

Dinner:

Baked Fish with Bacon (Recipe 26).	
Potato, weighed cooked	50 gm.
Beets, weighed cooked	100 "
Cauliflower, weighed cooked	100 "
Bran Cake (Recipe 10)	1
Butter	30 "
Cream, 40 per cent	30 "

Supper:

Meat, weighed cooked	45 gm.
Onions, weighed cooked	100 "
Tomatoes, weighed uncooked	100 "
Bran Cake (Recipe 10)	1
Butter	25 "
Cream, 40 per cent	20 "
Ice Cream (Recipe 88).	
Sliced peaches	80 "

DIET NUMBER 7.

Breakfast:

Shredded wheat	20 gm.
Egg yolks	2
Bacon	30 "
Soya Manna Muffin (Recipe 8)	½
Butter	20 "
Cream, 40 per cent	70 "
Milk	100 "

Dinner:

Salisbury Steak (Recipe 19).	
Turnips, weighed cooked	100 gm.
String beans, weighed cooked	100 "
Soya Manna Muffin (Recipe 8)	1
Butter	30 "
Cream, 40 per cent	70 "
Strawberries	44 "

Supper:

Deviled Egg (Recipe 35).	
Spinach, weighed cooked	75 gm.
Celery, weighed uncooked	25 "
Soya Manna Cake (Recipe 8)	½
Butter	20 "
Cream, 40 per cent	60 "
Blueberries	100 "

DIET NUMBER 8.

Breakfast:

Pineapple, fresh	70 gm.
Egg	1
Bacon	30 "
Bread	20 "
Butter	19 "
Cream, 40 per cent	60 "

Dinner:

Vegetable Soup (Recipe 14).	
Creamed Chicken and Asparagus (Recipe 22).	
Potato, weighed cooked	50 gm.
Bran Cake (Recipe 10)	1
Butter	30 "
Cream, 40 per cent	70 "

Supper:

Egg	1
Fried Tomatoes and Bacon (Recipe 48).	
Lettuce, cabbage, and celery salad	100 gm.
Bran Cake (Recipe 10)	1
Butter	20 "
Cream, 40 per cent	70 "
Orange	74 "

DIABETIC RECIPES

The following preparations are used at the present time in prescription diets for diabetic patients in the Mayo Clinic*:

Cellu Flour, Agar-agar, India Gum, Starch Free Baking Powder, Washed Bran, Sugar Free Flavorings, D-Zerta Diabetic Jello, the Chicago Dietetic Supply House, 1740 West Van Buren Street, Chicago. Fruits canned without sugar, Sprague Warner, Chicago. Hepco Flour, the Waukesha Health Products Company, Waukesha, Wisconsin, and Soya Manna Flour, the Vitæ Health Food Company, 360 Roy Street, Seattle, Washington. In the following recipes and menus Hepco Flour may be substituted for Soya Manna Flour, or vice versa.

Many of our patients have successfully canned their own fruits without sugar. The bran used in the recipes is ordinary miller's bran and may be secured at feed stores or mills. Prepared brans are expensive. All bran before it is used should be thrice boiled. A few of the recipes are modifications of recipes suggested by others. Most of them are original.

THRICE BOILED BRAN—RECIPE 1

Boil bran for fifteen minutes in a large amount of water, at least 8 cups of water to 1 cup of bran. Pour

* The Weber and Judd Company, Rochester, Minnesota, carry a complete stock of all of these preparations.

bran into a sieve, let cold water run through it for several minutes, then drain. Repeat three times, then dry bran carefully.

THRICE BOILED VEGETABLES—RECIPE 2

Lettuce, spinach, asparagus, or celery when prepared this way are reckoned as 1 per cent. vegetables. Cook vegetables until tender, drain off water, add boiling water, and boil for fifteen minutes. Drain off water, add boiling water, and boil for fifteen minutes. Drain and serve.

CELLU-BRAN BREAD—RECIPE 3

Cellu-flour	80 gm.
Bran, thrice boiled dry	50 "
Baking powder	10 "
India gum	10 "
Mineral oil	4 tablespoonfuls
Salt	a few grains
Hot water	

Mix dry ingredients thoroughly. Add the oil and just enough hot water to enable the mixture to be molded into a loaf about 2 inches in thickness. Bake in a greased pan in a very slow oven. Time required for baking one to one and a half hours. Wet, thrice boiled bran may be used if the quantity of water is diminished accordingly. No food value.

CELLU-BRAN MUFFINS—RECIPE 4

Cellu-flour	80 gm.
Dry, thrice boiled bran	50 "
Baking powder	10 "
India gum	10 "
Mineral oil	4 tablespoonfuls
Saccharin	½ gr.
Hot water	
Salt	a few grains

Mix dry ingredients thoroughly. Add oil and saccharin dissolved in a small amount of water. Add hot water sufficient to make a mixture which can be easily molded. Place in muffin tins, greased with mineral oil. Bake in a very slow oven, increasing heat to brown. No food value.

CELLU-BRAN WAFERS—RECIPE 5

Cellu-flour	25 gm.
Dry bran, thrice boiled	60 "
Cinnamon	1 teaspoonful
India gum	10 gm.
Mineral oil	3 tablespoonfuls
Hot water	100 gm.
Saccharin	1 gr.
Vanilla	
Salt	a few grains

Mix dry ingredients thoroughly. Add oil, vanilla, and hot water, in which the saccharin has been dissolved. Spread on an oiled baking sheet, cut in squares, and bake in a slow oven until dry. No food value.

CELLU-FLOUR GRIDDLE CAKES—RECIPE 6

Egg	1
Salt	½ teaspoonful
Hot water	2 tablespoonfuls
Cellu-flour	

Beat egg until light and creamy. Add salt, water, and sufficient cellu-flour to make a thick batter. Fry on hot griddle greased with mineral oil. This recipe contains 6 gm. protein and 6 gm. fat.

HEPCO CAKES—RECIPE 7

Eggs	2
Cream	60 gm.
Hepco flour	140 "
Butter	20 "
Water	150 "
Baking powder	5 "

Beat eggs, add cream, and then flour and baking powder, beating all the time. Add water and melted butter. Mold into twelve cakes and bake. Each cake contains 6 gm. protein and 6 gm. fat.

SOYA MANNA MUFFINS—RECIPE 8

Eggs	2
Cream	60 gm.
Soya Manna	140 "
Butter	20 "
Baking powder	5 "
Water	100 "

Beat eggs, add cream, and then flour and baking powder, beating all the time. Add water and melted butter. Mold into twelve cakes and bake. Each cake contains 6 gm. protein and 6 gm. fat.

OLMSTED BRAN CAKES—RECIPE 9

Bran, thrice boiled	3 cupfuls
India gum	1 tablespoonful
Baking powder	5 gm.
Salt	¼ teaspoonful
Eggs	2
Egg yolks	2
Butter	50 gm.
Water	180 "

Mix ingredients in order given and bake in a moderate oven. This recipe makes twelve cakes. Food value of three cakes 4 gm. protein and 17 gm. fat.

1-2-3 BRAN CAKES—RECIPE 10

Bran, thrice boiled	3 cupfuls
Eggs	3
Milk	100 gm.
Butter	16 "
Salt	1 teaspoonful
Baking powder	5 gm.
India gum	1 tablespoonful

Mix salt, India gum, baking powder, and bran together. Add beaten eggs, milk, and melted butter. Beat well. Divide into twelve cakes and bake in a

moderate oven until well browned. Food value of each cake 1 gm. carbohydrate, 2 gm. protein, and 3 gm. fat.

BRAN CAKES FOR CONSTIPATION—RECIPE 11

Bran, thrice boiled	420 gm.
India gum	30 "
Water	2½ tablespoonfuls
Salt	1 teaspoonful

Mix bran and India gum thoroughly and then add water. Caraway seeds may be added. Spread in a thin layer on a baking sheet or on the bottom of baking pans and press smooth, flat, and firm. Cut into cakes of desired size and bake in a moderate oven until dry and crisp. No food value.

NOODLE SOUP—RECIPE 12

Broth—clear	1 cupful
Egg	1
Butter	10 gm.
Salt and pepper	a few grains

Beat egg until stiff and bake in 10 gm. of butter as an omelet; let cool, cut into strips as noodles. Heat broth and add noodles. If desired, add vegetables, cut in cubes, using such variety and quantity as give flavor to soup; adding their food value to recipe. Food value, 6 gm. protein and 15 gm. fat.

TOMATO SOUP—RECIPE 13

Clear broth	1 cupful
Tomatoes, cooked	80 gm.
Onions, uncooked	10 "

To one cup of clear broth add 80 gm. of tomatoes and 10 gm. of onions cut fine. Cook for fifteen minutes. Season with salt and pepper and serve. Food value, 3 gm. carbohydrate and 1 gm. protein.

VEGETABLE SOUP—RECIPE 14

Clear broth	2 cupfuls
Vegetables, 5 per cent., uncooked	50 gm.
Vegetables, 10 per cent., uncooked	25 "

To two cupfuls of clear broth add 30 gm. of tomato, 10 gm. of celery, 10 gm. of cabbage, 15 gm. of onions, and 10 gm. of carrots. Cook until vegetables are tender. Season with salt and pepper. Food value, 3 gm. carbohydrate and 1 gm. protein.

NEW ENGLAND BOILED DINNER—RECIPE 15

Meat, uncooked	50 gm.
Vegetables, 5 per cent., uncooked	100 "
Vegetables, 10 per cent., uncooked	100 "
Vegetables, 15 per cent., uncooked	25 "

To 50 gm. of corned beef add three cupfuls of boiling water; simmer until the meat is tender. Remove meat, add 100 gm. of cabbage, 50 gm. of beets, 50 gm. of carrots, and 25 gm. of parsnips. Boil until tender. Add meat, reheat, and serve. Season with salt and pepper.

Food value, 13 gm. carbohydrate, 13 gm. protein, and 5 gm. fat.

NEW ENGLAND BOILED DINNER—RECIPE 16

Meat, uncooked	40 gm.
Vegetables, 5 per cent., uncooked	100 "
Vegetables, 10 per cent., uncooked	100 "
Vegetables, 15 per cent., uncooked	25 "
Potato, uncooked	100 "

To 40 gm. of corned beef add three cupfuls of boiling water; simmer until meat is tender. Remove meat; add 100 gm. of cabbage, 50 gm. of turnips, 50 gm. of carrots, 25 gm. of parsnips, and 100 gm. of potato. Boil until tender. Add meat, reheat, and serve. Season with salt and pepper. Food value, 33 gm. carbohydrate, 12 gm. protein, and 4 gm. fat.

BEEF STEW—RECIPE 17

Meat, uncooked	60 gm.
Vegetables, 5 per cent., uncooked	60 "
Vegetables, 10 per cent., uncooked	50 "

To 60 gm. of meat add two and one-half cupfuls of boiling water and one-fourth teaspoonful salt, and let simmer until tender. Remove meat from water and add 60 gm. of cabbage, 25 gm. of carrots, and 25 gm. of onions. Boil until vegetables are tender. Add meat, reheat, and serve. Season with salt and pepper. Food value, 5 gm. carbohydrate, 13 gm. protein, and 6 gm. fat.

BEEF STEW—RECIPE 18

Meat, uncooked	100 gm.
Vegetables, 5 per cent., uncooked	150 "
Vegetables, 10 per cent., uncooked	100 "

To 100 gm. of meat add three cupfuls of boiling water and one-fourth teaspoonful of salt, and let simmer until tender. Remove meat from water and add 50 gm. of cabbage, 50 gm. of tomato, 50 gm. of celery, 50 gm. of carrots, and 50 gm. of onions. Boil until vegetables are tender. Add meat, reheat, and serve. Season with salt and pepper. Food value, 11 gm. carbohydrate, 23 gm. protein, and 10 gm. fat.

SALISBURY STEAK—RECIPE 19

Round steak, fat, weighed uncooked	60 gm.
Onions, uncooked	25 "
Salt and pepper	a few grains.

Grind the meat, add onion and seasoning, and make into firm balls. Sear in hot mineral oil, then cook at a lower temperature. Food value, 1 gm. carbohydrate, 12 gm. protein, and 12 gm. fat.

VEAL BIRD—RECIPE 20

Meat, weighed uncooked	75 gm.
Olmstead bran cakes, crumbed	2
Chopped celery	25 "
Salt and pepper	a few grains
Milk	100 gm.

Have meat cut in one thin slice. Use the trimmings chopped fine in dressing of crumbs, celery and seasoning, moistened with water. Spread dressing on meat, roll and tie or skewer with toothpicks. Put in casserole and bake in milk until done. Food value, 6 gm. carbohydrate, 25 gm. protein, and 26 gm. fat.

ROAST PORK AND APPLES—RECIPE 21

Roast pork, lean, cooked	50 gm.
Apple	75 "
Butter	10 "

Put 50 gm. of roast pork (cooked) into small dish. Cover with 75 gm. of apples sliced and 10 gm. of butter. Add a small amount of water; cover and bake in a moderate oven about twenty minutes. Food value, 11 gm. carbohydrate, 13 gm. protein, and 16 gm. fat.

CREAMED CHICKEN WITH ASPARAGUS—RECIPE 22

Chicken, cooked	50 gm.
Asparagus, cooked	100 "
Milk	80 "
Cream	20 "
Butter	5 "

Cut 50 gm. of cooked chicken into small pieces. Add 100 gm. of asparagus. Heat 80 gm. of milk, 20 gm. of cream, and 5 gm. of butter. Pour over chicken and asparagus and reheat. Season with salt and pepper. Food value, 8 gm. carbohydrate, 17 gm. protein, and 20 gm. fat.

CREAMED CHICKEN WITH ASPARAGUS AND MUSHROOMS—RECIPE 23

Chicken, cooked	30 gm.
Asparagus, cooked	50 "
Mushrooms, cooked	50 "
Milk	100 "
Cream	35 "
Butter	10 "

Mix 30 gm. of cooked chicken, 50 gm. of asparagus, and 50 gm. of mushrooms together. Heat 100 gm. of milk, 35 gm. of cream, and 10 gm. of butter. Pour over chicken, asparagus, and mushrooms; reheat and serve. Season with salt and pepper. Food value, 10 gm. carbohydrate, 13 gm. protein, and 24 gm. fat.

CHICKEN STEW—RECIPE 24

Chicken broth	1½ cupfuls
Chicken, cooked	40 gm.
Potato, uncooked	100 "
Cream	60 "
Milk	80 "
Butter	15 "
Peas	40 "

Cook 100 gm. of potato in one and one-half cupfuls of clear chicken broth; save one-half cupful of the broth and add to it 60 gm. of cream, 80 gm. of milk, and 15 gm. of butter. Heat and add the cooked potato, 40 gm. of cooked chicken, and 40 gm. of cooked peas. Season with salt and pepper. Food value, 33 gm. carbohydrate, 19 gm. protein, and 34 gm. fat.

CHICKEN SUPREME—RECIPE 25

Chicken, weighed cooked	50 gm.
Egg	½
Milk	50 "
Celery	25 "
Salt and pepper	a few grains
Butter	5 gm.

Beat egg slightly, add chicken and celery, cut in small pieces, milk, salt, and pepper. Put in buttered mold, set in pan of hot water and bake in moderate oven until firm. Food value, 3 gm. carbohydrate, 17 gm. protein, and 17 gm. fat.

BAKED FISH WITH BACON—RECIPE 26

Put 50 gm. of uncooked fish in a small baking pan. Cover with 20 gm. of bacon. Bake in a moderate oven about twenty minutes. Food value, 11 gm. protein and 16 gm. fat.

BAKED FISH, SPANISH—RECIPE 27

Fish, uncooked	50 gm.
Water	½ cupful
Tomatoes, cooked	80 gm.
Onions, uncooked	10 "
Bacon	15 "

Put 50 gm. of fish in small baking dish, add one-half cupful of water, 80 gm. of cooked tomato, and 10 gm. of uncooked onions sliced fine. Cut 15 gm. of un-

cooked bacon into small pieces and add. Cover and bake in a moderate oven twenty minutes. Season with salt and pepper. Food value, 3 gm. carbohydrate, 12 gm. protein, and 13 gm. fat.

SALMON MOLDED—RECIPE 28

Salmon, weighed cooked	100 gm.
Egg yolk	1
Butter	5 "
Milk	50 "
Vinegar	1 tablespoonful
Salt	a few grains

Separate salmon into flakes. Add beaten yolk, melted butter, milk, vinegar, and salt. Cook over boiling water, stirring constantly until mixture thickens. Fill individual molds, chill, and serve with cucumber sauce. Food value, 3 gm. carbohydrate, 26 gm. protein, and 25 gm. fat.

CREAMED EGGS—RECIPE 29

Egg	1
Egg yolk	1
Milk	100 gm.
Cream	30 "
Butter	10 "

Cut one hard-boiled egg and the yolk of another hard-boiled egg into pieces and add them to 100 gm. of milk, 30 gm. of cream, and 10 gm. of butter which have been mixed together and heated. Season with salt

and pepper. Food value, 6 gm. carbohydrate, 12 gm. protein, and 30 gm. fat.

BAKED EGG AND TOMATO—RECIPE 30

Tomato, uncooked	100 gm.
Egg	1
Butter	10 "

Scoop out the center of a raw tomato that weighs 100 gm.; drop the egg into the tomato; cover with the scooped-out tomato pulp. Add 10 gm. of butter. Season with salt and pepper and bake about fifteen minutes in a moderate oven. Food value, 3 gm. carbohydrate, 7 gm. protein, and 15 gm. fat.

POACHED EGG AND TOMATO—RECIPE 31

Tomato, cooked	100 gm.
Egg	1

Put 100 gm. of cooked tomato in a small pan; when the tomato is boiling drop the egg into the center. Remove the pan to a cooler part of the stove and let stand until the egg white is firm and a film forms over the yolk. Season with salt and pepper and serve. Food value, 3 gm. carbohydrate, 7 gm. protein, and 6 gm. fat.

EGG WITH TOMATO SAUCE—RECIPE 32

Egg, hard cooked	1
Pale American cheese	10 gm.
Tomato, cooked	50 "
Salt and pepper	a few grains
Butter	5 gm.

Mash egg yolk and mix with salt and pepper. Chop egg white fine and put in the bottom of a buttered baking dish. Then add the yolk. Cover with cooked tomato and sprinkle cheese on top. Bake long enough to melt cheese. Serve hot. Food value, 2 gm. carbohydrate, 9 gm. protein, and 14 gm. fat.

BAKED EGG WITH CHEESE—RECIPE 33

Egg	1
Cream	15 gm.
Pale American cheese	25 "
Butter	5 "

Butter a small dish with 5 gm. of butter. Add the egg, 15 gm. of cream, and 25 gm. of cheese grated fine. Bake in moderate oven until cheese is melted. Food value, 1 gm. carbohydrate, 14 gm. protein, and 22 gm. fat.

CHEESE CUSTARD—RECIPE 34

Egg	1
Cold water	2 tablespoonfuls
Butter, melted	10 gm.
Cream	50 "
Pale American cheese	20 "
Salt and pepper	a few grains

Beat egg slightly, add cold water, cream, butter, grated cheese, salt, and pepper. Put into a buttered baking dish and bake in a moderate oven until firm. Food value, 3 gm. carbohydrate, 13 gm. protein, and 32 gm. fat.

DEVILED EGG—RECIPE 35

Egg, hard cooked	1
Lemon juice	5 gm.
Mustard	a few grains
Paprika	"
Salt and pepper	"
Melted butter	5 gm.
Salad dressing with mineral oil	1 teaspoonful

Cut egg in halves (lengthwise). Mix yolk thoroughly with seasonings, melted butter, and salad dressing. Refill white. Food value, 1 gm. carbohydrate, 6 gm. protein, and 10 gm. fat.

SCALLOPED EGG WITH COTTAGE CHEESE—RECIPE 36

Cottage cheese	40 gm.
Egg, hard cooked	1
Milk	40 "
Salt and pepper	a few grains
Butter	10 gm.

Put into a small buttered casserole a layer of sliced egg and alternate with cottage cheese. Add salt and pepper, cover with milk, and bake in a moderate oven about ten minutes. Food value, 4 gm. carbohydrate, 16 gm. protein, and 16 gm. fat.

COTTAGE CHEESE OMELET—RECIPE 37

Eggs	2
Milk	10 gm.
Cottage cheese	25 "
Salt and pepper	a few grains

Add milk to egg yolks and beat until thick and lemon colored. Then add cheese, salt and pepper, and fold in stiffly beaten egg-whites. Bake as ordinary omelet. Food value, 2 gm. carbohydrate, 17 gm. protein, and 13 gm. fat.

VEGETABLE OMELET—RECIPE 38

Eggs	2
Vegetable, 5 per cent., asparagus or tomato, cooked	25 gm.
Water	1 tablespoonful
Salt and pepper	a few grains

Add water, salt, and pepper to egg yolks and beat until yolks are thick and lemon colored. Then add vegetable and stiffly beaten egg-whites. Bake as ordinary omelet. Food value, 1 gm. carbohydrate, 12 gm. protein, and 12 gm. fat.

CHEESE FONDU—RECIPE 39

American cheese	30 gm.
Hepco cake or Soya Manna cake	½
Cream	30 "
Egg	1
Paprika and salt	a few grains

Put the cheese, crumbed Hepco cake, and cream into a saucepan; cook slowly until well blended, add the beaten egg yolk and fold in the beaten white. Bake in oiled baking dish until firm. Food value, 2 gm. carbohydrate, 19 gm. protein, and 26 gm. fat.

RAREBIT—RECIPE 40

Toasted Hepco cake	1
Butter	10 gm.
Cheese, pale American	25 "
Cream	75 "

Spread half the butter on Hepco toast, mix rest of butter, cheese, and cream and cook over hot water until well blended. Pour on toasted Hepco cake and serve immediately. Food value, 4 gm. carbohydrate, 15 gm. protein, and 38 gm. fat.

CABBAGE SOUFFLE—RECIPE 41

Cabbage, cooked	100 gm.
Lean meat, cooked, minced	15 "
Sour cream	35 "
Egg	1
American cheese	10 "
Salt and pepper	a few grains

Chop cabbage fine, add meat, cream, beaten egg, salt, and pepper. Put into mold and sprinkle grated cheese over top. Bake in a moderate oven until firm and brown. Food value, 5 gm. carbohydrate, 15 gm. protein, and 19 gm. fat.

CELERY RAMEKINS—RECIPE 42

Milk	50 gm.
Hepco Cake	$\frac{1}{2}$
Celery	25 "
Egg	1
Butter	5 "
Salt and pepper	a few grains

Heat milk; add crumbed Hepco cake, grated celery, and seasonings, let come to a boil, add butter, remove from fire; add beaten egg yolk. Fold into beaten white. Put in ramekin and bake twenty or thirty minutes in slow oven until well browned. Food value, 3 gm. carbohydrate, 11 gm. protein, and 15 gm. fat.

BAKED CAULIFLOWER WITH CHEESE—RECIPE 43

Cauliflower, cooked	150 gm.
Tomato, cooked	100 "
Cheese	25 "
Butter	10 "

Butter a small dish with 10 gm. of butter. Add 150 gm. of cauliflower cooked, 100 gm. of tomato, and 25 gm. of pale American cheese grated. Bake in moderate oven twenty minutes; 150 gm. of cabbage may be substituted for 150 gm. of cauliflower. Food value, 8 gm. carbohydrate, 10 gm. protein, and 17 gm. fat.

BAKED ONION—RECIPE 44

Onions, uncooked	50 gm.
Ground meat, lean, cooked	10 "
Milk	15 "
Butter	5 "
Salt and pepper	a few grains

Parboil the onion, scrape out the inside, leaving only the shell. Weigh shell and scrapings to 50 gm. Add meat, butter and seasoning, and return to shell. Put

into casserole, add milk, and bake until tender. Food value, 4 gm. carbohydrate, 4 gm. protein, and 6 gm. fat.

SPINACH PUDDING—RECIPE 45

Spinach, cooked	100 gm.
Egg	1
Ham (cooked and minced)	25 "
Cream	35 "
Onion juice	3 drops
Butter	10 gm.
Nutmeg	a few grains
Salt	"

Beat the egg, add spinach, ham, cream, onion juice, nutmeg, and salt. Put into buttered mold and bake in moderate oven until firm and brown. Food value, 5 gm. carbohydrate, 13 gm. protein, and 27 gm. fat.

SQUASH SOUFFLE—RECIPE 46

Milk	50 gm.
Squash, cooked	100 "
Egg	1
Butter	5 "
Salt and pepper	a few grains

Stir milk slowly into squash, add beaten egg yolk, salt, and pepper. Fold in beaten egg-white. Put into small buttered baking dish and bake in a moderate oven until firm. Food value, 8 gm. carbohydrate, 8 gm. protein, and 12 gm. fat.

SCALLOPED CABBAGE WITH BACON—RECIPE 47

Cabbage, weighed uncooked	50 gm.
Bacon	30 "
Bran, thrice boiled	1 tablespoonful

Boil cabbage (cut fine) in a large amount of water for twenty minutes, drain, and put into small casserole or cup. Cut bacon into small pieces, fry until crisp, then add one tablespoonful of dry, thrice boiled bran. Add this mixture to cabbage and bake in hot oven ten minutes. Food value, 2 gm. carbohydrate, 4 gm. protein, and 20 gm. fat.

FRIED TOMATOES WITH BACON—RECIPE 48

Bacon, cut thin	20 gm.
Tomato, uncooked	100 "
Salt and pepper	a few grains

Fry bacon until crisp, remove from pan, and add tomato cut in $\frac{1}{2}$-inch slices. Fry until tomatoes are tender. If more grease is needed, add mineral oil. Serve hot with bacon. Food value, 3 gm. carbohydrate, 3 gm. protein, and 13 gm. fat.

CREAMED POTATO—RECIPE 49

Potato, cooked	100 gm.
Cream	30 "
Milk	30 "
Butter	10 "

Mix 30 gm. of cream, 30 gm. of milk, and 10 gm. of butter, and heat. Add 100 gm. of cooked potato, diced. Season with salt and pepper and serve. Food value, 23 gm. carbohydrate, 4 gm. protein, and 16 gm. fat.

WILTED LETTUCE—RECIPE 50

Lettuce	50 gm.
Bacon, cut fine	30 "
Cream	15 "
Vinegar	10 "
Salt	$\frac{1}{8}$ teaspoonful
Pepper	a few grains

Cut bacon in small pieces and cook until crisp. Add cream to hot bacon grease and then the vinegar, salt, and pepper. Cook together for one minute, then pour over lettuce. Serve at once. Food value, 3 gm. carbohydrate, 4 gm. protein, and 23 gm. fat.

WILTED LETTUCE WITH EGG YOLK—RECIPE 51

Lettuce	30 gm.
Bacon	30 "
Egg yolk	1
Vinegar	1 tablespoonful
Salt and pepper	a few grains

Cut bacon into small pieces and fry until crisp, add egg yolk, and scramble. Then add vinegar and pour mixture over lettuce. Food value, 1 gm. carbohydrate, 5 gm. protein, and 26 gm. fat.

TOMATO JELLY SALAD—RECIPE 52

Tomato, cooked	100 gm.
Onions, uncooked	10 "
Allspice	$\frac{1}{8}$ teaspoonful
Cloves	$\frac{1}{8}$ "
Gelatin	2 gm.
Salt and pepper	a few grains

Cook 100 gm. of tomato, 10 gm. of onions, and $\frac{1}{8}$ teaspoonful of allspice and $\frac{1}{8}$ teaspoonful of cloves for five minutes. Strain through cheese-cloth and add enough water to make $\frac{3}{4}$ cupful. Soak 2 gm. of gelatin in $\frac{1}{4}$ cupful of cold water and then add hot tomato juice. Chill and serve. Food value, 4 gm. carbohydrate and 3 gm. protein.

TOMATO ASPARAGUS SALAD—RECIPE 53

Gelatin	3 gm.
Water	1 tablespoonful
Tomato, cooked	90 gm.
Asparagus, cooked	10 "

Soak the gelatin in cold water and dissolve in hot strained tomato. Add seasoning, put in mold, and when nearly set, put asparagus in with tips standing up. Food value, 3 gm. carbohydrate and 5 gm. protein.

VARIETY SALAD—RECIPE 54

Gelatin	6 gm.
Cold water	$\frac{1}{2}$ cupful
Vinegar, hot	$\frac{3}{4}$ "
Boiling water	$\frac{3}{4}$ "
Salt	$\frac{1}{2}$ teaspoonful
Celery, uncooked, cut fine	50 gm.
Cabbage, uncooked, cut fine	50 "
Green peppers, cut fine	20 "
Lettuce, cut fine	10 "

Soak gelatin in cold water, add vinegar, boiling water, and salt. When liquid has cooled, add other

ingredients. Mold and chill. This recipe makes four servings. Food value, 5 gm. carbohydrate and 7 gm. protein.

CHEESE AND TOMATO SALAD—RECIPE 55

Tomato, uncooked	100 gm.
American cheese	25 "
Olive oil	5 "
Salt and pepper	a few grains
Vinegar	½ teaspoonful

Scrape out tomato, mix with grated cheese. Add the oil and seasoning; refill the tomato and serve on 10 gm. lettuce. Food value, 3 gm. carbohydrate, 8 gm. protein, and 14 gm. fat.

EGG AND CUCUMBER SALAD—RECIPE 56

Egg, hard cooked	1
Cucumber, uncooked	50 gm.

Cut egg and cucumber in thin slices, arrange in circle (alternating egg and cucumber) having slices overlap each other. Fill in center with parsley or water cress. Serve with mayonnaise dressing made with mineral oil. Food value, 2 gm. carbohydrate, 7 gm. protein, and 6 gm. fat.

GREEN PEPPER STUFFED WITH COTTAGE CHEESE—RECIPE 57

Green pepper	22 gm.
Cottage cheese	20 "
Paprika and salt	a few grains

Remove seed from the inside of green pepper. Weigh. Fill with cheese that has been well blended with seasoning. Chill. Cut in slices and serve. Food value, 2 gm. carbohydrate and 5 gm. protein.

HINDU SALAD—RECIPE 58

Lettuce, shredded	25 gm.
Tomato, uncooked	100 "
Celery, uncooked, cut fine	15 "
Water-cress, cut fine	10 "

Arrange lettuce on plate, cut tomato into four slices. On two slices put celery and on the other two the water-cress. Serve with mayonnaise made with mineral oil. Food value, 5 gm. carbohydrate and 2 gm. protein.

FROZEN TOMATO SALAD—RECIPE 59

Tomatoes, cooked	100 gm.
Salt and pepper	a few grains

Season and strain tomatoes. Fill a small tin with mixture, cover with oiled paper, then with a tight fitting cover. Pack in equal portions of ice and salt. Let stand two hours. Remove from mold and serve on lettuce leaf with mayonnaise dressing made with mineral oil. Food value, 3 gm. carbohydrate and 1 gm. protein.

STUFFED TOMATO SALAD—RECIPE 60

Tomato, uncooked	100 gm.
Celery, uncooked, cut fine	25 "
Mayonnaise dressing with mineral oil	1 tablespoonful
Lettuce	10 gm.
Salt and pepper	a few grains

Cut off top of tomato, scoop out center. Mix the pieces of tomato, celery, salt, pepper, and mayonnaise. Return to tomato and serve on lettuce leaf. Food value, 4 gm. carbohydrate and 1 gm. protein.

CABBAGE AND TOMATO SALAD—RECIPE 61

Cabbage, uncooked	30 gm.
Tomatoes, uncooked	60 "
Lettuce	10 "

Chop cabbage rather fine, cut tomatoes into cubes. Mix together and serve on 10 gm. of lettuce. Serve with mayonnaise, made with mineral oil, or French dressing. Food value, 3 gm. carbohydrate and 1 gm. protein.

JAPANESE SALAD—RECIPE 62

Lettuce, shredded	10 gm.
Orange	50 "
Tomatoes, fresh	25 "
Pineapple, fresh	50 "
Cream	25 "

Mix and chill, add a little vinegar to cream, pour over salad. Food value, 12 gm. carbohydrate, 2 gm. protein, and 5 gm. fat.

CABBAGE AND APPLE SALAD—RECIPE 63

Cabbage, shredded	40 gm.
Apple, cut fine	30 "
Lettuce	10 "

Mix shredded cabbage and apple together and serve on lettuce with mayonnaise made with mineral oil. Food value, 6 gm. carbohydrate and 1 gm. protein.

WALDORF SALAD—RECIPE 64

Apple	30 gm.
Celery	20 "
Walnuts	10 "
Lettuce	10 "

Cut apples, celery, and nuts into small pieces, mix with mayonnaise, made with mineral oil, and serve on lettuce. Food value, 7 gm. carbohydrate, 7 gm. protein, and 6 gm. fat.

MAYONNAISE DRESSING WITH MINERAL OIL—RECIPE 65

Egg yolk	1
Mineral oil	2 cupfuls
Vinegar	2 tablespoonfuls
Salt	1 teaspoonful
Pepper	a few grains

Beat the egg yolk until thick. Add oil, drop by drop, beating all the time. Then add little vinegar, then oil slowly, then vinegar as necessary. Add salt and pepper. Have all ingredients cold. This will make about twelve servings. Food value, 2 gm. protein and 6 gm. fat.

MAYONNAISE DRESSING WITH OLIVE OIL—RECIPE 66

Egg yolk	1
Olive oil	¾ cupful
Vinegar	1 tablespoonful
Salt	1 teaspoonful
Pepper	a few grains

Beat the egg yolk until thick. Add oil drop by drop, beating all the time. Then add little vinegar, then oil slowly, then vinegar, as necessary. Add salt and pepper. Have all ingredients cold. Food value, 2 gm. protein and 186 gm. fat. Food value of one tablespoonful, 19 gm. fat.

FRENCH DRESSING—RECIPE 67

Olive oil	15 gm.
Vinegar	5 "
Salt and pepper	a few grains

Add oil slowly to vinegar, salt, and pepper. Beat well. Food value, 15 gm. fat. If mineral oil is substituted for the olive oil, this dressing will have no food value.

THOUSAND ISLANDS DRESSING—RECIPE 68

Egg yolk	1
Mineral oil	2 cupfuls
Vinegar	2 tablespoonfuls
Salt	1 teaspoonful
Pepper	a few grains
Celery and radish	35 gm.
Green peppers	22 "

Beat yolks, add cold oil drop by drop, beating all the time. Add a little vinegar, then oil, a little at a time until all oil and vinegar have been used. Add salt, pepper, celery, radish, and pepper, chopped fine. Food value, 2 gm. carbohydrate, 2 gm. protein, and 6 gm. fat.

CREAM SAUCE—RECIPE 69

India gum	1½ teaspoonfuls
Water	1 tablespoonful
Milk	100 gm.
Butter	10 "
Salt and pepper	a few grains

Heat water and milk to boiling. Add the gum very slowly, stirring constantly. If the mixture lumps, beat smooth with Dover Egg Beater. Add butter, salt, and pepper. Food value, 5 gm. carbohydrate, 3 gm. protein, and 12 gm. fat.

HOLLANDAISE SAUCE—RECIPE 70

Egg yolk	1
Cream	35 gm.
Butter	5 "
Salt and pepper	a few grains
Lemon juice	10 gm.

Beat egg yolk, add cream and butter. Cook in double boiler until thick, stirring constantly, add salt and pepper. Add lemon juice before serving. Food value, 2 gm. carbohydrate, 3 gm. protein, and 17 gm. fat.

CUCUMBER SAUCE—RECIPE 71

Cucumber, uncooked	50 gm.
Cream, 40 per cent	20 "
Vinegar	1 teaspoonful
Salt and pepper	a few grains

Chop and drain cucumber. Whip cream, then add cucumbers, salt, pepper, and vinegar. Food value, 2 gm. carbohydrate, 1 gm. protein, and 8 gm. fat.

TOMATO SAUCE—RECIPE 72

Tomatoes, cooked	100 gm.
Butter	10 "
Salt	a few grains
Paprika	"

Strain tomato; heat until enough water has evaporated so that the sauce is thick, add seasonings, and cook until well blended. Food value, 3 gm. carbohydrate, 1 gm. protein, and 8 gm. fat.

ORANGE SAUCE—RECIPE 73

Orange juice	25 gm.
Water	$\frac{1}{4}$ cupful
Egg yolk	1
Almonds, ground	5 gm.

Mix orange juice, water, and egg yolk. Cook until thick in double boiler; add ground almonds. If not flavored to taste, add diabetic orange flavoring. Food value, 4 gm. carbohydrate, 3 gm. protein, and 9 gm. fat.

MAPLE SYRUP—RECIPE 74

Agar-agar	2 gm.
Hot water	1 cupful
Mapleine extract	¼ teaspoonful
Saccharin	¼ grain

Dissolve the agar-agar in hot water. Cook until the mixture is clear, add Mapleine, remove from fire, and add saccharin. Serve hot. No food value.

FRENCH TOAST—RECIPE 75

Bread	35 gm.
Egg	½
Milk	50 "
Salt	a few grains

Beat one-half egg until thick and lemon colored. Add milk and salt. Mix well. Dip bread in mixture and fry in mineral oil. If diet allows, bread may be fried in 10 gm. of butter, increasing the fat 8 gm. Food value, 21 gm. carbohydrate, 8 gm. protein, and 6 gm. fat.

PURITY CUSTARD—RECIPE 76

Egg-white	1
Salt	⅛ teaspoonful
Vanilla	
Milk	100 gm.

Beat the egg-white with a fork. Add the salt, a few drops of vanilla, and the milk. Mix well. Pour into

a custard cup placed in a dish of water, and bake in a moderate oven. Food value, 5 gm. carbohydrate, 7 gm. protein, and 4 gm. fat.

CUSTARD—RECIPE 77

Egg	1
Egg yolk	1
Salt	$\frac{1}{8}$ teaspoonful
Vanilla	
Milk	100 gm.
Cream	30 "

Beat the egg and egg yolk with a fork. Add the salt, a few drops of vanilla, milk, and cream. Mix well. Pour into a custard cup placed in a dish of water, and bake in a moderate oven. If desired, saccharin may be added. Food value, 7 gm. carbohydrate, 12 gm. protein, and 22 gm. fat.

CUSTARD—RECIPE 78

Egg	1
Salt	
Vanilla	
Milk	100 gm.
Cream	40 "

Beat the egg. Add salt, a few drops of vanilla, saccharin if desired, milk, and cream. Mix well. Pour into a custard cup placed in a dish of water, and bake in a moderate oven. Food value, 7 gm. carbohydrate, 10 gm. protein, and 18 gm. fat.

JUNKET—RECIPE 79

Milk	100 gm.
Cream	35 "
Junket	¼ tablet
Cold water	1 tablespoonful
Vanilla	

Heat milk and cream until lukewarm, or 100° F. Dissolve the junket tablet in the cold water. Add the dissolved junket tablet and a few drops of vanilla to the lukewarm milk. Stir quickly several times; pour into custard cups and let stand in a warm place until set; then place in refrigerator. Food value, 7 gm. carbohydrate, 4 gm. protein, and 11 gm. fat.

JUNKET—RECIPE 80

Milk	80 gm.
Cream	20 "
Junket	¼ tablet
Cold water	1 tablespoonful
Vanilla	

Prepare as Recipe 79. Food value, 5 gm. carbohydrate, 3 gm. protein, and 7 gm. fat.

AGAR-AGAR JELLY—RECIPE 81

Agar-agar	1 tablespoonful
Water	1 quart
Lemon juice	1 teaspoonful
Saccharin	2 grains
Diabetic flavoring	1 tablespoonful

Mix agar-agar and cold water together. Bring slowly to boiling-point, stirring constantly. Boil three minutes, cool, add lemon juice, saccharin, and diabetic flavoring. Mold and chill. No food value.

RASPBERRY JELLY—RECIPE 82

Gelatin	8 gm.
Cold water	1 cupful
Boiling water	3 cupfuls
Raspberry flavoring	2 tablespoonfuls
Saccharin	1 grain

Soak the gelatin in cold water for five minutes. Then add boiling water, raspberry flavoring, and saccharin. Put in a cold place to jell. This recipe makes six servings. Food value of recipe, 7 gm. protein.

FRUIT JELLO—RECIPE 83

Dissolve the contents of one envelope of Orange D-Zerta (Diabetic Jello) in half a measuring cup of boiling water. Stir until entirely dissolved, set in cool place. When jello begins to set, fold in 30 gm. of 40 per cent. cream, whipped. Then add 5 gm. of walnuts, 20 gm. of banana, and 23 gm. of orange or strawberries, all cut fine. Allow to harden. Food value, 8 gm. carbohydrate, 4 gm. protein, and 15 gm. fat. This recipe makes one large serving.

SNOW PUDDING—RECIPE 84

Gelatin	½ teaspoonful
Cold water	1 "
Boiling water	2 tablespoonfuls
Egg white	1 tablespoonful
Lemon juice	1 teaspoonful
Saccharin	½ grain

Soak the gelatin in cold water, dissolve in boiling water, and let cool. Add lemon juice to gelatin, then fold in stiffly beaten egg-white and saccharin dissolved in 1 teaspoonful of cold water. Beat until stiff. Mold and chill. Food value, 4 gm. protein.

COFFEE JELLY—RECIPE 85

Gelatin	8 gm.
Cold water	1 cupful
Boiling coffee	3 cupfuls
Saccharin	1 grain

Soak the gelatin in cold water. Add the boiling coffee and saccharin. Stir the gelatin until it is dissolved. Mold and chill. This will make about six servings. Food value of recipe, 7 gm. protein.

COFFEE BAVARIAN—RECIPE 86

Gelatin	3 gm.
Cold water	40 "
Clear coffee, boiling	100 "
Saccharin	1 grain
Egg white	1

Soak the gelatin in cold water. Add the boiling coffee and saccharin. When jelly begins to thicken, fold in egg-white beaten stiff. Chill. This recipe makes one serving. Food value, 7 gm. protein.

BAVARIAN CREAM—RECIPE 87

Egg	1
Water	½ cupful
Gelatin	6 gm.
Lemon rind, grated	¼ teaspoonful
Diabetic Mapleine	¼ "

Soak gelatin in ¼ cupful of cold water. Beat yolk of egg, add lemon rind, and ¼ cupful of water; and add mixture to soaked gelatin. Cook in double boiler, stirring constantly until the mixture begins to thicken. Remove from fire. Add stiffly beaten egg-white and Mapleine. Set in pan of ice-water and beat with egg whip until mixture begins to set. Pour into molds and let stand until firm. Food value, 11 gm. protein and 6 gm. fat.

ICE CREAM—RECIPE 88

Cream, 40 per cent	100 gm.
Water	½ tablespoonful
Egg	1
Saccharin	½ grain
Diabetic vanilla	½ teaspoonful

Beat the yolk of egg until very light, add cream slowly. Fold in beaten white of egg. Then add vanilla and saccharin which has been dissolved in one-half

tablespoonful of water. Freeze. Food value, 3 gm. carbohydrate, 8 gm. protein, and 46 gm. fat.

COFFEE MOUSSE—RECIPE 89

Gelatin	30 gm.
Cold water	¼ cupful
Boiling water	¼ "
Strong coffee, boiling	¾ "
Saccharin	½ grain
Cream, 40 per cent	100 gm.

Soak gelatin in cold water, add boiling water, then coffee. Cool and add saccharin, which has been dissolved in one teaspoonful of cold water. When mixture begins to set, add whipped cream and whip all together. Put in mold and chill. Food value, 3 gm. carbohydrate, 5 gm. protein, and 40 gm. fat.

COFFEE PARFAIT—RECIPE 90

Strong coffee	1 cupful
Egg	1
India gum	1 teaspoonful
Cream, 40 per cent	100 gm.
Saccharin	½ grain

Boil coffee and India gum, pour slowly over beaten egg, stirring constantly, and cook in double boiler until the mixture thickens; remove from the stove, add the saccharin, dissolved in one teaspoonful of water. Cool. Whip cream until stiff and add to the other mixture. Put into mold and pack in ice and salt

for three or four hours. Food value, 3 gm. carbohydrate, 8 gm. protein, and 46 gm. fat.

PRUNE WHIP—RECIPE 91

Prunes, weighed cooked	35 gm.
Cream, 40 per cent	20 "

Stone the prunes and mash; fold into whipped cream; chill and serve. Food value, 8 gm. carbohydrate, 1 gm. protein, and 8 gm. fat.

BROWN BETTY—RECIPE 92

Apple	75 gm.
Egg-white	1
Butter	10 "
Crumbs (Cellu-bran wafers)	2 tablespoonfuls
Lemon juice	6 drops
Nutmeg	$\frac{1}{8}$ teaspoonful

Stew the apple and cool. Beat the egg-white stiff, add apple, nutmeg, and lemon juice. Butter dish, add one-third the butter and one-half the egg, and apple mixture in alternate layers. Let top layer be of crumbs with remaining bits of butter. Bake about thirty minutes in moderate oven. Food value, 11 gm. carbohydrate, 5 gm. protein, and 8 gm. fat.

CRACKER PUDDING—RECIPE 93

Cellu-bran wafers	8
Milk	175 gm.
Egg	1
Vanilla (Diabetic)	$\frac{1}{4}$ teaspoonful

Crumb eight Cellu-bran wafers into a small casserole. Add milk, beaten egg yolk, and vanilla. Bake in a slow oven one-half hour. Beat white stiff and heap lightly on pudding. Return to moderate oven to brown. Food value, 9 gm. carbohydrate, 11 gm. protein, and 13 gm. fat.

CELLU PIE CRUST—RECIPE 94

Cellu flour	50 gm.
India gum	10 "
Mineral oil	4 tablespoonfuls
Hot water	
Salt	a few grains

Mix Cellu flour, salt, and India gum thoroughly. Add oil and sufficient hot water to moisten to a dough. Toss on a board dredged with Cellu flour, pat, and roll out. Bake in a hot oven.

Some prefer to use only half the amount of mineral oil indicated in this recipe.

SQUASH PIE—RECIPE 95

Egg	1
Squash, cooked	150 gm.
Cream	100 "
Cinnamon	¼ teaspoonful
Nutmeg	¼ "
Salt	a few grains
Saccharin	½ grain

Beat egg, add mashed squash, cream, spice, salt, and saccharin dissolved in one teaspoonful of cold

water. Bake in moderate oven until firm in center, using Cellu-flour recipe for pie crust. Bake crust first. Food value, 14 gm. carbohydrate, 10 gm. protein, and 26 gm. fat.

CHEESE STRAWS—RECIPE 96

American cheese, grated	50 gm.
Cellu pie crust	½ recipe

Roll pie crust and spread with the grated cheese, fold over, and roll out ¼ inch thick. Cut into ½-inch strips and bake in a hot oven. Food value, 15 gm. protein and 18 gm. fat.

CHEESE CANAPES—RECIPE 97

Soya Manna muffin	½
Pale American cheese	10 gm.

Spread grated cheese on top of muffin. Toast in oven and serve hot. Food value, 6 gm. protein, and 7 gm. fat.

SPICE COOKIES—RECIPE 98

Eggs	2
Saccharin	½ grain
Cream	10 gm.
Spices, cinnamon, cloves, nutmeg	1 teaspoonfu
Almonds, ground	20 gm.

Beat the yolks, add saccharin dissolved in cream, then spices and ground almonds. Add to the stiffly beaten whites. Drop from spoon on oiled pan and bake

in hot oven. Food value, 4 gm. carbohydrate, 16 gm. protein, and 25 gm. fat.

ALMOND MACAROONS—RECIPE 99

Almonds, cut fine	20 gm.
Egg-whites	2
Saccharin	½ grain

Dissolve saccharin in a few drops of water, beat the egg-whites to a stiff froth, stir in the almonds and saccharin; bake in a very moderate oven on waxed paper. Food value of 12 macaroons, 3 gm. carbohydrate, 12 gm. protein, and 11 gm. fat.

MARGUERITES—RECIPE 100

Cellu-bran wafers	
Egg-white	1
Almonds	5 gm.
Saccharin	½ grain

Beat egg-white until stiff, add saccharin dissolved in one-half tablespoonful of water, and almonds chopped fine. Spread mixture on Cellu-bran wafers and put in oven until delicately browned. Food value, 1 gm. carbohydrate, 5 gm. protein, and 3 gm. fat.

COCOA SHELLS—RECIPE 101

Cocoa shells	30 gm.
Milk	150 "

Soak the cocoa shells overnight in one cupful of water. Bring slowly to the boiling-point. Add the milk, heat, strain, and serve. Saccharin may be added if desired. Food value, 8 gm. carbohydrate, 5 gm. protein, and 7 gm. fat.

SECTION IX

TABLES OF FOOD VALUES

The following vegetables, fruits, and nuts have been classified according to their carbohydrate content by Dr. Elliott P. Joslin. This classification is of great convenience:

TABLE I

5 per cent.	10 per cent.	15 per cent.	20 per cent.
Cucumbers	Pumpkin	Green peas	Potato
Lettuce	Turnip	Artichokes	Canned lima beans
Spinach	Kohl-rabi	Parsnips	Baked beans
Asparagus	Squash		
Rhubarb	Beets	Apples	
Endive	Carrots	Pears	Plums
Marrow	Onions	Apricots	Bananas
Sorrel	Leeks	Blueberries	Prunes, cooked without sugar
Sauerkraut		Cherries	
Beet greens	Grapefruit*	Currants	
Dandelion greens	Lemons	Raspberries	
Swiss chard	Oranges	Huckleberries	
Celery	Cranberries		English walnuts
Tomato	Strawberries	Hickory nuts	
Brussels sprouts	Blackberries	Black walnuts	Almonds
Water-cress	Gooseberries	Filberts	
Sea kale	Peaches	Beechnuts	25 per cent.
Cauliflower	Pineapple	Pecans	Peanuts
Egg plant	Watermelon		
Cabbage			
Radishes	Brazil nuts		
String beans			
Brocoli			
Mushrooms			
Butternuts			

* Fruits canned without sugar have the same composition as the fresh fruits.

Reckon the available carbohydrate in the vegetables of the 5 per cent. group as 3 per cent.; of the 10 per cent. group as 6 per cent. All of the vegetables in these two groups contain less than 5 to 10 per cent. carbohydrate respectively. The carbohydrates in the other vegetables together with that of the fruits and nuts should be reckoned as listed above.

In the process of cooking, foods lose both in weight and in carbohydrate content, due to the loss of water and carbohydrate which is dissolved out. These losses approximately balance each other, so that the foods may be weighed either fresh or after cooking, provided the water in which they are cooked is discarded. When they are served in the water in which they are cooked, as is the case with stewed rhubarb, vegetable soups, and stewed fruits, they should be weighed fresh.

The following table contains most of the common foods entering into the composition of diabetic diets. For more complete tables consult Locke, E. A., "Food Values," D. Appleton & Co., New York, or Atwater, W. A., and Bryant, A. P., "The Chemical Composition of American Food Materials," Bulletin No. 28, United States Department of Agriculture. The latter publication may be obtained by sending 10 cents in coin to the Superintendent of Documents, Government Printing Office, Washington, D. C.

TABLE II

Vegetables and Fruits:	Percentage composition: Carbohydrate, per cent.	Protein, per cent.	Fat, per cent.	Sugar value, per cent.
Vegetables, 5 per cent.....	3	1	0	3
Thrice cooked vegetables, 5 per cent.....	1	0	0	
Vegetables, 10 per cent.....	6	1	0	6
Vegetables, 15 per cent.....	15	2	0	16
Shelled green peas.....	15	7	0	19
Vegetables, 20 per cent:				
Potato.....	20	2	0	21
Beans (shelled).....	20	7	0	24
Green corn.....	20	3	1	22
Fruits, 10 per cent.....	10	1	0	10
Fruits, 15 per cent.....	15	1	0	15
Fruits, 20 per cent.....	20	1	0	20
Green olives.....	2	1	10	3
Ripe olives.....	4	1	20	5
Nuts:				
Butternuts.....	3	28	61	25
Brazil nuts.....	7	17	67	23
Hickory nuts.....	11	15	67	26
Black walnuts.....	12	28	56	34
Pecans.....	13	11	71	26
Filberts.....	13	15	66	28
Beechnuts.....	13	22	57	31
English walnuts.....	16	17	63	32
Almonds.....	17	21	55	35
Peanuts.....	24	26	39	43
Chestnuts.....	42	6	5	46

TABLE II (*Continued*)

Cereals and Bread-stuffs:	Percentage composition: Carbohydrate, per cent.	Protein, per cent.	Fat, per cent.	Sugar value, per cent.
Oatmeal (weighed dry)	67	16	7	77
Rice (weighed dry)	79	8	0	84
Shredded wheat	78	10	1	84
White bread	53	9	2	58
Whole wheat bread	49	10	1	55
Corn bread	46	8	5	51
Rye bread	53	9	1	58
Olmsted Bran cakes (3 cakes, Recipe 9)	0	4	17	4
One-two-three bran cakes (each cake, Recipe 10)	1	2	3	2
Hepco cakes (Recipe 7)	0	6	6	4
Wheat flour	76	8	1	81
Cellu flour (Dietetic Cellulose Co.)	0	0	0	0
Dairy Products:				
Whole milk	5	3	4	7
Skimmed milk	5	3	0	7
Cream, 16 per cent	5	3	16	8
*Cream, 20 per cent	5	3	20	9
Cream, 40 per cent	3	2	40	8
Buttermilk	5	3	1	7
Koumiss	5	3	2	7
Butter	0	1	85	9
Cheese, American (pale)	0	29	36	20
Cheese, American (red)	0	30	38	21

* Cream used in recipes is 20 per cent. fat unless otherwise stated.

TABLE II (*Continued*)

	Percentage composition:			
Dairy Products:	Carbohydrate, per cent.	Protein, per cent.	Fat, per cent.	Sugar value, per cent.
Cheese, cottage	4	21	1	16
Cheese, Swiss	1	28	35	21
Eggs, each	0	6	6	4
Egg white (one)	0	4	0	2
Egg yolk (one)	0	2	6	2
Meats and Fish:				
Meat, lean, fresh	0	20	10	13
Meat, lean, cooked	0	25	15	16
Beef, roast fat, cooked	0	22	29	16
Bacon, lean	0	16	43	14
Bacon, fat	0	10	67	12
Fish, halibut, lake trout, perch, whitefish	0	18	5	11
Fish, salmon, fresh or canned	0	22	13	14
Oysters	4	6	1	8
Lard, tallow, oleomargarine, cod-liver oil, olive oil, Crisco, and other oils except mineral oil	0	0	85 to 100	8 to 10
Mineral oil	0	0	0	0

FUEL VALUE OF FOOD SUBSTANCES

1 gram of carbohydrate = 4.1 calories
1 gram of protein = 4.1 "
1 gram of fat = 9.3 "

In Table II fractions of grams have been omitted in order to facilitate the patient's work in estimating his diet.

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